

the period of structural deterioration, the magnitude of deterioration, and the time for recovery in a widely distributed soil of the region. The mean weight diameter of wet-sieved aggregates (MWD) was determined in grazed and ungrazed (exclosure) plots. Aggregate MWD was often lower in the soil under grazing (from 4.4 to 5.1 mm) than in that of the exclosed area (from 4.7 to 5.4 mm). This reduction in aggregate size was attributable to the mechanical shearing action of trampling. Soil water content accounted for 74% of the variation in aggregate MWD under grazing. At low soil water contents, the structure of the grazed soil became less stable. Grazing effects on soil structural stability are significant only in periods when the soil dries. Stocking rates must be regulated at those dry periods.

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547. Water quality of surface runoff from grazed fescue grassland watershed in Alberta.

Mapfumo, E.; Willms, W. D.; and Chanasyk, D. S.
Water Quality Research Journal of Canada 37(3): 543-562. (2002); ISSN: 1201-3080

Descriptors: nutrients (mineral)/ carbon/ pathogens/ parasites/ environmental impact/ agricultural runoff/ Giardia/ Cryptosporidium/ Canada, Alberta

Abstract: A study was conducted at Stavely Research Station, Alberta, to determine the quantity and quality of surface runoff from small grassland watersheds under three grazing intensities, viz. ungrazed, heavy grazing and very heavy grazing. The volume of surface runoff varied each year (1998, 1999 and 2000) and also differed across watersheds, with lower runoff in the ungrazed compared with the heavy and very heavy grazed watersheds. Total dissolved solids in surface runoff water ranged between 34 to 360 mg L super(-1), and that for runoff from the very heavy grazed watershed was greater than that from other watersheds. Electrical conductivity increased with increased grazing intensity on the watershed. In two of three years the very heavy grazed watershed had greater nitrate concentrations than the other two watersheds. In all three years the levels of nitrate were lower than the maximum acceptable level for drinking water. Levels of orthophosphate in surface runoff from all three watersheds and the three years of study were less than 1 mg L super(-1), and mostly within the range considered typical for rivers and streams. Total carbon was greater than the amounts

considered typical for streams and rivers, and most of it was organic carbon. Nuisance organisms such as algae, nematodes, Giardia spp., Cryptosporidium spp. and rotifers were detected in some surface runoff samples. However, no crustaceans were detected. The results of a canonical correlation analysis indicated that the dominant external forcing factors (meteorological and management) in influencing water quality were year of study, water temperature and grazing. Surface runoff discharge did not influence water quality measurements. The dominant water quality parameters were found to be total carbon, organic carbon, total dissolved solids and electrical conductivity. Overall, this study indicated that during the three years, the surface runoff volumes from the watersheds were small and grazing of these watersheds posed little risk of nutrient contamination of adjacent streams, but organic carbon loading and dissolved solids may be of concern. The presence of parasites was detected in two or less runoff water samples each year, and thus pose little risk of contamination of adjacent streams. However, it may be necessary to monitor parasites especially in areas under cow-calf operations.

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548. Water quality within lightly-grazed and protected isolated wetlands in south-central Florida.

Tanner, G. W. and Terry, W. S.
In: Fiftieth Annual Meeting of the Soil and Crop Science Society of Florida. (Held 26 Sep 1990-28 Sep 1990 at Daytona Beach, Florida, USA.); Vol. 50.; pp. 80-84; 1991.
Notes: ISSN: 0096-4522
NAL Call #: 56.9 So32

Descriptors: cattle resource management

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549. Watershed responses to grazing management.

Gifford, G. F.
In: Interior west watershed management: Proceedings of a Symposium. (Held 8 Apr 1980-10 Apr 1980 at Spokane, Wash.) Baumgartner, David M. (eds.)
Pullman, Wash.: Washington State University, Cooperative Extension; pp. 147-159; 1981.
NAL Call #: TC423.6.15

Descriptors: watersheds/ grazing management

This citation is from AGRICOLA.

Fish and Wildlife Effects

550. Allocating forage among wild and domestic ungulates: A new approach.

Johnson, B. K.; Ager, A.; Crim, S. A.; Wisdom, M. J.; Findholt, S. L.; and Sheehy, D.

In: Proceedings of a symposium on sustaining rangeland ecosystems. (Held 29 Aug 1994-31 Aug 1994 at Eastern Oregon State College, La Grande, Oregon.) Edge, W. D. and Olsen-Edge, S. L. (eds.); Vol. Special Report 953. Corvallis, Ore.: Oregon State University Extension Service; pp. 166-169; 1996.

NAL Call #: 100 Or3M no.953

Descriptors: resource allocation/ stocking rate/ computer software/ simulation models/ geographical information systems/ grazing/ wild animals/ grasslands/ rangelands/ range management/ models/ grazing behaviour

Abstract: The allocation of rangeland forage between

domestic and wild ungulates is discussed and none of the methods tried are considered satisfactory. The difficulty of combining static and dynamic environmental factors on a seasonal basis to quantify and predict the distribution of ungulates and vegetation is described. A case study is presented using computer-aided spatial analysis models and linear programming formulation to allocate forage among elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*) and cattle. The results were displayed on 3-dimensional computer-generated images to show where forage was removed by each animal species on a monthly basis.

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551. An annotated bibliography on the interaction of range management (livestock grazing, brush management and prescribed burning) or nonmanagement with wildlife habitat and wildlife.

Kozicky, Edward L.; Fulbright, Timothy E.; and Texas. Fisheries & Wildlife Division. Wildlife Section Austin, Tex.: Texas Parks & Wildlife Dept., 1991. 293 p.
NAL Call #: SF85.K69 1991
Descriptors: bibliographies/ fires/ burns/ grazing/ habitat alterations/ management/ range management/ wildlife/ abstracts/ bibliography/ wildlife management/ range ecology/ wildlife habitat improvement/ natural resources
 © NISC

552. Avian community responses to fire, grazing, and drought in the tallgrass prairie.

Zimmerman, John L.
 In: Ecology and conservation of Great Plains vertebrates/ Knopf, Fritz L. and Samson, Fred B.; Series: Ecological Studies 125.
 New York: Springer-Verlag, 1997; pp. 167-180.
Notes: ISBN 0387948023; ISSN 0070-8356
NAL Call #: QH540.E288 v.125
Descriptors: conservation/ drought/ fire/ forest fragment/ grazing/ Great Plains/ tallgrass prairie/ terrestrial ecology
 © The Thomson Corporation

553. Avian nest success in relation to past grazing regimes in a montane riparian system.

Ammon, Elisabeth and Stacey, Peter B.
Condor 99(1): 7-13. (1997)
NAL Call #: QL671.C6; ISSN: 0010-5422
Descriptors: livestock grazing regime/ montane riparian system/ nest predation rates/ nest success/ terrestrial ecology/ vegetation composition/ vegetation structure
Abstract: One possible link between livestock grazing and bird population declines is variation in nest predation rates. To explore this possibility we documented vegetational differences in a montane riparian community subdivided by a fence, one side of which traditionally has been summer-grazed, and the other side rested from grazing for 30 years. We found that ground vegetation was more abundant, willows (*Salix* spp.) less abundant, and vertical vegetational diversity was lower on the grazed relative to the rested side. Predation rates on real nests were higher on the grazed side compared to the rested side. Artificial nests were placed (1) in mixed conifer vegetation to mimic the most common nest types currently present in the riparian zone, (2) in streamside willows that differed in abundance across the fence, and (3) in old-willow remnants distant from the stream, which were equally abundant on both sides of the fence. All artificial above-ground nests, and ground nests in the old-willow experiment, suffered greater predation rates on the grazed compared to the rested side. Thus, livestock grazing may not only affect availability of nesting substrates for riparian birds by reducing streamside vegetation, but could influence bird populations by facilitating nest predation, possibly by increasing detectability of nests or through changes in predator assemblage.
 © The Thomson Corporation

554. Avian responses to late-season grazing in a shrub-willow floodplain.

Stanley, Thomas R. and Knopf, Fritz L.
Conservation Biology 16(1): 225-231. (2002)
NAL Call #: QH75.A1C5; ISSN: 0888-8892
Descriptors: late season grazing: avian response/ shrub willow floodplain: habitat
Abstract: Riparian vegetation in western North America provides important habitat for breeding birds and valuable forage for grazing livestock. Whereas a number of studies have documented the response of riparian vegetation to the removal of cattle, few have experimentally evaluated specific grazing systems. We evaluated the responses of vegetation and breeding birds to two cycles of late-season (August-September) grazing followed by 34 months of rest on the Arapaho National Wildlife Refuge, Colorado. We used a before-and-after control-impact (BACI) design, with two control (ungrazed) and two treatment (grazed) pastures composing the experimental units. Vegetation characteristics and bird densities were quantified on sample plots prior to and following two cycles of the treatment. We found no statistical differences in vegetation change and few differences in bird-density change among pastures. Inspection of means for pastures, however, suggests that changes in shrub vigor and spatial pattern differed among ungrazed and grazed pastures and that changes in population density for three of the nine bird species and three guilds studied differed among pastures. Our results suggest that habitat for grazing-sensitive birds may be restored while still allowing late-season grazing, although the rate at which species are recovered will be slower than if all cattle are removed.
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555. Bird and small mammal populations in a grazed and ungrazed riparian habitat in Idaho.

Medin, D. E. and Clary, W. P.
 Ogden, Utah: US Department of Agriculture, Forest Service, Intermountain Research Station; Research Paper INT-425, 1990. 10 p.
Notes: ISSN 0886-7380
NAL Call #: A99.9 F764U
Descriptors: wildlife/ birds/ mammals/ habitats/ rangelands/ riparian buffers/ grazing/ Idaho
 This citation is from AGRICOLA.

556. Bird community changes in gray alder forests due to grazing by cattle.

Pettersen, R.
Fauna Norvegica Series C Cinclus 10(1): 1-6. (1987);
 ISSN: 0332-7701
Descriptors: *Alnus incana*/ *Anthus trivialis*/ *Emberiza citrinella*/ population census/ Norway
Abstract: The composition of the breeding passerine bird community in a grey alder *Alnus incana* forest in Central Norway was censused in 1981, 1982 and 1984. One part of the forest has been intensively grazed for years. The second part was grazed for the first time in 1983. A lower density was found in the grazed plot compared to the ungrazed plot. All bird species reduced their densities, with the exception of two pioneer species, *Anthus trivialis* and *Emberiza citrinella*, which had their greatest densities in the grazed area. The diversity of the bird species (H') was slightly greater in the grazed area than in the ungrazed area. The bird density in the formerly ungrazed area was

reduced by 46% (adjusted for control plot) after one year of grazing. All species present reduced their densities. A significant difference was found in the composition of birds in the ungrazed plot compared to the grazed plot. The difference was not significant after one year of grazing in the ungrazed plot.

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557. Bird-habitat relationship in semi-arid natural grasslands and exotic pastures in the west pampas of Argentina.

Isacch, J. P.; Maceira, N. O.; Bo, M. S.; Demaria, M. R.; and Peluc, S.

Journal of Arid Environments 62(2): 267-283. (2005)

NAL Call #: QH541.5.D4J6; ISSN: 0140-1963

Descriptors: Argentina/ commercial enterprises/ communities/ disturbances/ ecosystems/ farming and agriculture/ grasslands/ habitat use/ land zones/ natural grassland replacement by exotic pasture/ neotropical region/ San Luis Province/ semi arid grassland/ South America/ species diversity/ wildlife/ human relationships
Abstract: In the semi-arid grasslands of the west pampas, in Argentina, extended natural grasslands still persist only with cattle grazing. However, in the last years there has been an important increase in the cultivation of African pasture species. We evaluated the incidence of the replacement of natural grasslands by exotic pastures on bird diversity in spring summer and in winter. In five different grassland habitats (two native and three sown pastures), we sampled bird populations using the strip transect method and vegetation variables simultaneously at the same sites. We used multiple regressions to examine the relative importance of habitat variables on richness, abundance and presence of bird species. The replacement of native grasslands (Sorgastral) by sown pastures results in habitat modifications such as changes in green vegetation, percentage of bare ground and distance to trees. When native grasslands are moderately grazed (mixed grassland) plant species richness increases notably relative to other native and exotic pastures. Some vegetation variables were correlated with bird species richness or with some bird populations. However, the habitat variable that best described bird species richness and bird abundance was plant species richness, which varied both with the grazing history of the native grassland and with the type of pasture used as replacement. Consequently, grassland replacement by sown pastures in the west pampas results in changes in bird alpha diversity; decreasing diversity with respect to mixed grasslands, but favoring it in relation to the climax grassland (Sorgastral). The composition of grassland bird communities in natural grasslands would be little affected by exotic pastures replacement. However, since some vegetation variables best represented in some habitats had particular effects on the abundance and presence of specific grassland birds, managers and policy makers should take into account the complexity of the processes associated with changes in land use of the west pampas. This would not only decrease the probability of negative effects on the total bird diversity but also would decrease the risk of local extinction of declining species. [copyright] 2005 Elsevier Ltd. All rights reserved.

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558. Bird numbers in relation to grazing on a grouse moor from 1957-61 to 1988-98.

Jenkins, David and Watson, Adam

Bird Study 48(1): 18-22. (2001); ISSN: 0006-3657

Descriptors: behavior/ birds/ bogs/ farmland/ grazing/ habitat alterations/ habitat use/ sheep/ status/ wildlife/ livestock relationships/ peregrine/ willow grouse/ black grouse/ partridge/ domestic sheep/ census/ population ecology/ interspecies relations/ population size: local/ trends/ moorland/ oystercatcher/ lapwing/ curlew/ red grouse/ grey partridge/ golden plover/ ring ouzel/ whinchat/ European whinchat/ European wheatear/ northern wheatear/ wheatear/ common cuckoo/ cuckoo/ Eurasian cuckoo/ European cuckoo/ European grey cuckoo/ grey cuckoo/ short-eared owl/ moorhen/ common gallinule/ common moorhen/ Eurasian curlew/ European curlew/ western curlew/ redshank/ common redshank/ common snipe/ Eurasian oystercatcher/ European oystercatcher/ European golden-plover/ greater golden-plover/ white wagtail/ meadow pipit/ northern lapwing/ mallard/ mallard duck/ common teal/ Europe/ United Kingdom/ Scotland
Abstract: Birds were counted before and after heavy grazing on a Scottish grouse moor. Oystercatchers *Haematopus ostralegus*, lapwings *Vanellus vanellus* and curlews *Numenius arquata* increased where high sheep stocks and grass seeding converted much ling *Calluna vulgaris* to smooth grass, but not where heath remained. A healthy part that held many gamebirds in 1957-61 but later became short grass had no red grouse *Lagopus lagopus scoticus*, black grouse *Tetrao tetrix* or grey partridge *Perdix perdix* in 1989-98. The study area held many golden plover *Pluvialis apricaria* in 1957-61 but none in 1989-98.

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559. Birds as grazing indicator species in southeastern Arizona.

Bock, C. E. and Webb, B.

Journal of Wildlife Management 48(3): 1045-1049. (1984)

NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: *Eremophila alpestris*/ *Aimophila cassinii*/ *Chondestes grammacus*/ *Ammodramus savannarum*/ grassland/ density/ habitat/ environmental condition

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560. Bobwhite habitat use under short duration and deferred-rotation grazing.

Wilkins, R. N. and Swank, W. G.

Journal of Range Management 45(6): 549-553. (1992)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1992/456/9wilk.pdf>

Descriptors: *Colinus virginianus*/ habitats/ grazing/ semiarid zones/ rangelands/ wildlife management/ population density/ Texas

Abstract: A study was conducted in the South Texas Plains to contrast the short-term impacts of short duration grazing (SDG) and deferred-rotation grazing (DG) systems on habitats for northern bobwhites (*Colinus virginianus*). Foliar cover, species richness, and structural attributes of the vegetation were compared at radio-location sites (quail-used) and sites along random transects (available) within and between the 2 grazing systems. Quail-used sites were characterized by increased species richness, forb cover, and bare ground and decreased plant height and litter accumulations. Principal components analysis revealed that available sites on the SDG during the fall and winter were

scored higher along a habitat gradient which had greater species richness and forb cover combined with diminished litter accumulations. This habitat gradient explained 41% of the variation in the ground layer variables. In addition, mark-recapture studies suggested positive population responses on the SDG during the first year following its initiation. Short-term improvements in bobwhite habitats may be realized by initiating SDG on some semiarid rangelands.

This citation is from AGRICOLA.

561. Breeding bird abundance and habitat on two livestock grazing regimes in North Dakota.

Buskness, Natoma A.; Murphy, Robert K.; Higgins, Kenneth F.; and Jenks, Jonathan
South Dakota Academy of Science Proceedings 80(2001)
NAL Call #: 500 SO82; ISSN: 0096-378X
Abstract: [unedited] To help sustain prairie wildlife habitat on privately owned lands in North Dakota, prescribed rotational grazing (RG) systems have been implemented as part of the Prairie Pothole Joint Venture (PPJV) of the North American Waterfowl Management Plan. However, impacts of these systems on nongame breeding birds are unmeasured. During 1996 and 1997 we assessed the relative abundance, species richness, and habitat of breeding birds especially passerines on five PPJV-prescribed RG pastures in central and northwestern North Dakota. Each RG pasture was paired with a nearby traditional, continuous-grazed (CG) pasture for comparison. Using 5-minute point counts on 100-m radius plot to survey breeding birds, we recorded 30 species in 1996 and 29 species in 1997. We detected no differences in relative abundance or species richness between grazing regimes in 1996 ($P = 0.29$ and 0.58), but relative abundance and species richness were greater on RG pastures than on CG pastures in 1997 ($P = 0.08$ and 0.04), a relatively dry year. A group of five species (savannah sparrow [*Passerculus sandwichensis*], grasshopper sparrow [*Ammodramus saviannarum*], western meadowlark [*Sturnella neglecta*], bobolink [*Dolichonyx oryzivorus*], Baird's sparrow [*Ammodramus bairdii*]) considered sensitive to heavy grazing in previous studies had a higher collective mean abundance on RG than on CG in 1997 (bar $x = 4.29$ and 2.75 breeding pairs/point count, $P = 0.03$). Litter depth also was greater on RG than on CG in 1997 (bar $x = 2.4$ and 1.4 cm, $P = 0.04$). PPJV grazing systems help conserve native prairie by improving its economic viability without diminishing habitat values for grassland passerines, and in dry years may enhance breeding bird habitat compared to that on traditional grazing systems especially for grazing-sensitive species such as bobolink and Baird's sparrow.
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562. Can cows and fish co-exist?

Fitch, L. and Adams, B. W.
Canadian Journal of Plant Science 78(2): 191-198. (1998)
NAL Call #: 450 C16; ISSN: 0008-4220
Descriptors: agriculture/ grazing management/ riparian ecosystem
Abstract: Our paper provides an ecological perspective on the interrelationship between livestock grazing and riparian areas through a review of topical literature. We also describe the Alberta Riparian Habitat Management Project (also known as "Cows and Fish"), and draw upon our experience to provide a perspective on future riparian

management actions. Those actions should begin with an understanding that prairie landscapes evolved with herbivores, in a grazing regime timed and controlled by season and climatic fluctuations where grazing by native grazers was followed by variable rest periods. Prevailing range management principles represent an attempt to imitate the natural system and describe ecologically based grazing systems. Traditionally, range management guidelines have focused on grazing practices and impacts in upland, terrestrial rangelands, with a lack of attention devoted to riparian areas. Three decades of riparian investigation have quantified the effect unmanaged livestock grazing can have on range productivity and watershed function. We contend that suitable grazing strategies for riparian areas will be developed first by understanding the function of riparian systems and then by applying range management principles to develop riparian grazing strategies. A key step towards determining the fit of livestock grazing is an understanding of the formation of riparian systems and their ecological function. We describe riparian structure, function and process to provide linkages between livestock grazing, riparian vegetation health and stream channel dynamics. We summarize the effects of unmanaged livestock grazing on riparian habitats and fish and wildlife populations. The general conclusion is that unmanaged grazing results in overuse and degradation of riparian areas. The literature provides several options for the development of riparian grazing strategies. We provide an overview of strategies suitable for riparian areas in Southern Alberta which should maintain ecological function and sustained use.

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563. Can livestock be used as a tool to enhance wildlife habitat?

Severson, Kieth E.
Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, US Department of Agriculture, Forest Service; Series: General Technical Report RM-194; 123 p. (1990)
Notes: 43rd Annual Meeting of the Society for Range Management, Reno, Nev., February 13, 1990
NAL Call #: aSD11.A42 no.194
Descriptors: livestock/ *Cervus elaphus*/ *Antilocapra americana*/ *Odocoileus hemionus*/ forage/ grazing/ *Cervus elaphus nelsoni*/ *Centrocercus urophasianus*
This citation is from AGRICOLA.

564. Cattle grazing and sharp-tailed grouse nesting success.

Kirby, D. R. and Grosz, K. L.
Rangelands 17(4): 124-126. (1995)
NAL Call #: SF85.A1R32; ISSN: 0190-0528
Descriptors: Phasianidae/ nesting/ rangelands/ nests/ rotational grazing/ cattle/ grazing/ North Dakota
This citation is from AGRICOLA.

565. Cattle management to enhance wildlife habitat in south Texas.

Ortega, S. J. Alfonso and Bryant, Fred C.
Wildlife Management Bulletin of the Caesar Kleberg Wildlife Research Institute 6: 1-11. (2005)
Descriptors: animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ habitat/ land zones/ Nearctic Region/ USA/

North America/ comprehensive zoology: farming and agriculture/ cattle management strategies/ rangeland habitat management applications/ habitat management/ terrestrial habitat/ rangeland habitat/ Texas/ south/ cattle management strategies applications/ rangelands/ Phasianidae/ Galliformes/ Aves/ birds/ chordates/ mammals/ ungulates/ vertebrates

Abstract: For cattle ranching operations in South Texas, wildlife recreation can be a very important source of income for those who choose to diversify. In many cases, income from wildlife such as hunting leases is higher than the income obtained from cattle. Range, cattle, and wildlife management practices need to be adjusted to achieve rangeland sustainability, fulfill the requirements of multiple animal species, and optimize economic output. Under the climatic conditions of South Texas, specific strategies to adjust cattle stocking rates at the first signs of drought are required if valuable range plants and wildlife productivity are to be maintained. We discuss strategies of cattle grazing, including rates of use, grazing systems, stocking rate adjustments based on range condition, calculation of correct stocking rate, and guidelines to adjust livestock numbers based on spring and fall moisture availability. In South Texas, all wildlife species are important to consider in the context of total ranch management. We offer these guidelines to those who are interested in fostering compatible cattle and wildlife operations while protecting the integrity of rangeland, watershed, habitat, and soil resources. We use South Texas as a model to encourage the development of similar strategies and prescriptions for other arid and semiarid regions to help preserve rangeland habitat integrity and optimize biological and economic output.

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566. Cattle trampling of simulated ground nests under short duration and continuous grazing.

Koerth, B. H.; Webb, W. M.; Bryant, F. C.; and Guthery, F. S.

Journal of Range Management 36(3): 385-386. (1983)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1983/363/27koer.pdf>

Descriptors: bird

Abstract: Trampling by cattle on simulated ground nests [of birds] were compared between continuous (CONT) grazing at 8.0 ha/steer and short duration grazing (SDG) at 5.3 ha/steer. Trampling losses were similar under CONT grazing (15%) and SDG (9%) at a nest density of 1/ha. Percentage trampling loss did not increase at higher nest densities under either grazing regime. Nest survival curves indicated a loss rate of 2.21%/wk under CONT grazing and 2.09%/wk under SDG. SDG with cattle will probably not increase trampling loss of ground nests over CONT grazing.

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567. Changes in abundance and diversity of microarthropods associated with fescue prairie grazing regimes.

Clapperton, M. Jill; Kanashiro, Derrick A.; and Behan Pelletier, Valerie M.

Pedobiologia 46(5): 496-511. (2002)

NAL Call #: 56.8 P343; ISSN: 0031-4056

Descriptors: field experiment: experimental method/ livestock grazing: plant community structure influence, soil

health influence, soil quality influence/ orthic black chernozemic: udic haploboroll/ disturbance severity/ fescue prairie grazing regimes/ grassland productivity/ grazing recovery exclosure/ heavy grazing regime/ light grazing regime/ soil bulk density/ soil depth/ soil moisture/ soil temperature

Abstract: Livestock grazing influences plant community structure, soil quality and health, and is likely to also affect the populations and diversity of soil biota. In our study, we determined the abundance and family level diversity of soil mites under very heavy and light grazing regimes, and a very heavy grazing exclosure, and asked whether there were differences in abundance of mite taxa that reflected the severity of disturbance. The field experiment we sampled was established in 1949 on a Rough Fescue Prairie with Orthic Black Chernozemic (Udic Haploboroll) soils near Stavely Alberta Canada. Soil cores were taken from the light (L)(1.2 AUM (animal unit month) ha⁻¹) and very heavy (VH) (4.8 AUM ha⁻¹) grazing regimes and the grazing recovery exclosure (Ex) in the very heavy grazing site in June and October 1999. The results showed that the soil temperature, moisture and bulk density varied between the grazing regimes, soil depth and the sampling times. Collembola were not abundant at any of the sites compared with Acari. Among Acari, prostigmatid mites were significantly more abundant in VH site and all the grazing treatments at both depths and sampling times. Oribatida, and to a lesser extent Mesostigmata, were more closely associated with reduced and undisturbed habitats than the Prostigmata, and there was a positive relationship between increased grassland productivity and the abundance and diversity of soil microarthropods. Our results suggest that Acari are sensitive to soil disturbance.

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568. Changes in breeding wader populations on lowland wet grasslands in England and Wales: Causes and potential solutions.

Wilson, Andy M.; Ausden, Malcolm; and Milsom, Tim P.

Ibis 146(Suppl. 2): 32-40. (2004); ISSN: 0019-1019

Descriptors: breeding wader populaiton/ climate change/ conservation concern/ drainage/ grassland management/ grazing regime/ lowland wet grassland/ nature reserve/ reseedling

Abstract: Populations of waders breeding on lowland wet grassland in England and Wales have declined markedly in recent decades; the loss of once widespread species such as Lapwing *Vanellus vanellus*, Snipe *Gallinago gallinago* and Redshank *Tringa totanus* from many areas is of particular conservation concern. These declines are due to loss of grassland to other land uses, and to significant changes in grassland management. Drainage, reseeding and changes in grazing regimes have all been particularly detrimental to lowland wet grassland in terms of a breeding habitat for waders. Careful management of key sites, many of them managed as nature reserves, has shown that wader declines can be halted or even reversed. Aspects of this management can be applied to larger areas through agri-environment schemes, such as the Environmentally Sensitive Areas (ESA) scheme, Tir Gofal (in Wales) and Countryside Stewardship (in England) but these need be carefully targeted to ensure that the benefits for waders are maximized. In particular, it has been shown that higher tier management options within the ESA scheme (those that enhance the landscape) are more cost-effective than lower

tier options (those that maintain the landscape). The extent and suitability of lowland wet grassland will face further pressure in years to come as a result of climate change, the impacts of which need to be assessed and mitigated against.

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569. Channelization and livestock impacts on salmonid habitat and biomass in western Washington.

Chapman, D. W. and Knudsen, E.

American Fisheries Society: Transactions 109(4): 357-363. (1980)

NAL Call #: 414.9 Am3; ISSN: 0002-8487

Descriptors: channelization/ grazing/ habitat alterations/ management/ research--rivers and streams/ riparian habitat/ fish/ ecology/ flowing waters/ rivers/ streams/ salmonids/ North America/ United States/ Washington/ Salmonidae

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570. Characterization of soil mesofauna in a xero-Mediterranean ecosystem after a 3-year grazing management.

Cancela Da Fonseca, J.; Ghabbour, S. I.; and Hussein, A. K. M.

Ecologia Mediterranea 10(1-2): 121-132. (1984); ISSN: 0153-8756

Descriptors: *Anabasis articulata*/ *Thymelaea hirsuta*/ *Messor* spp./ *Heterogamia syriaca*/ detritivore/ herbivore/ soil fertility/ ascending hierarchic classification/ correspondence analysis/ prescribed burning

Abstract: A plot of 47.6 ha at the Omayed Biosphere Reserve, 83 km west of Alexandria [Egypt] and 10 km south of the seashore, was subjected to varying intensities of grazing pressure [GP] by sheep and goats since 1977, as follows: F1, 50% GP preceded by complete protection from 1974 to 1977; F2, completely protected since 1974; F3, 50% GP; F4, 25% GP; while FO is the outside free-grazing areas with 100% GP. Soil mesofauna were sampled from July 1979-July 1980 under *Anabasis articulata* and *Thymelaea hirsuta*, from windward and leeward sides, making a total of 30 samples for each habitat type. The compositional relation of taxa was investigated by the ascending hierarchic classification (AHC) and correspondence analysis (CA) methods. Results indicate the effect of proximity, but the main controlling factor in ordination is the intensity of GP, so that the faunal assemblages of all F2 habitats are on one side of the factorial axis and the assemblages of the FO habitats on the other, with the F1 and F3 (including F4) occupying intermediate positions. Some detritivores are disfavored by complete protection, while some herbivores (or phytophages, or pests), like the seed harvester ants (*Messor* spp.), are clearly favored. Accumulation of undercomposed organic matter may eventually lead to deterioration in soil fertility as detritivores (e.g., the sand roach *Heterogamia syriaca*) are gradually being eliminated. Prescribed burning may be advisable to overcome some shortcomings of complete and prolonged protection.

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571. Collembola of loess grassland: Effects of grazing and landscape on community composition.

Dombos, Miklos

Soil Biology and Biochemistry 33(15): 2037-2045. (2001)

NAL Call #: S592.7.A1S6; ISSN: 0038-0717

Descriptors: animals and man/ disturbance by man/ commercial activities/ ecology/ habitat/ terrestrial habitat/ land and freshwater zones/ Palaearctic Region/ Europe/ Collembola: farming and agriculture/ sheep grazing pressure/ biomass/ community structure/ effects of grazing and landscape/ grassland/ soil habitat/ loess grassland soil/ Hungary/ Budapest/ mezofold/ effects of sheep grazing pressure and landscape/ loess grassland/ Collembola/ Insecta/ arthropods/ insects/ invertebrates

Abstract: In loess grasslands, grazing by sheep is responsible for changes in the composition of vegetation and controls on secondary successional processes. Grazing has a very complex effect on the soil by altering its physical, chemical and biological properties, which makes it difficult to distinguish the underlying mechanisms. Landscape heterogeneity also influences soil and vegetation processes, having a greater effect on environmental factors than sheep grazing. To compare the relative effects of sheep grazing and one aspect of landscape heterogeneity on the collembolan community, four valleys with two grazing treatments were selected. The sides of each valley had SW and NE aspects resulting in two types of landscape heterogeneity. In a split-plot experimental design, the effects of grazing pressure and aspect were examined in relation to the relative abundance, species richness, evenness and composition of the collembolan community. Grazing pressure had a positive effect on total abundance and a negative effect on species richness of Collembola. Aspect did not significantly influence total abundance but valley sides exposed to SW had a higher species richness. Grazing changed the dominance structure, reduced the evenness and strongly influenced the composition of the collembolan community. Due to grazing xerotherm epedaphic species disappeared resulting a less diverse Collembola fauna. Aspect had a lesser effect on collembolan community composition than grazing. The results suggest that the diversity of springtails maintained by landscape heterogeneity in loess valley sides is reduced by sheep grazing. Further, differences in soil humidity could not explain the changes in structure and abundance of the collembolan community alone, sheep grazing may drive changes in collembolan community through mechanisms of biotic effects.

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572. Comparative effects of sheep and cattle grazing on an anadromous fish stream in central Idaho.

May, B. E. and Somes, W. L.

In: Proceedings of the Annual Conference of the Western Association of Fish and Wildlife Agencies. (Held 19 Jul 1982-22 Jul 1982 at Las Vegas, Nevada.); Vol. 62.; pp. 490-500; 1982.

NAL Call #: SK351.W47

Descriptors: habitat alterations/ grazing/ management/ research--rivers and streams/ riparian habitat/ North America/ United States/ Idaho

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573. A comparison of the Coleoptera, Araneae and Formicidae fauna in a grazed native grassland remnant of Victoria.

Hadden, Susan A. and Westbrooke, Martin E.
 In: The other 99%: The conservation and biodiversity of invertebrates. (Held December 09-12, 1997 at Sydney, NSW, Australia.) Ponder, W. F. and Lunney, Daniel (eds.) Mosman, NSW, Australia: Royal Zoological Society of New South Wales; pp. 101-106; 1999.
Notes: Transactions of the Royal Zoological Society of New South Wales; ISBN 0958608512
NAL Call #: QL362.45 .O83 1999
Descriptors: biomass/ botanical composition/ community structure/ grazing/ invertebrate conservation/ management implications/ native grassland remnants/ species abundance/ book chapter/ meeting paper
 © The Thomson Corporation

574. Conservative and moderate grazing effects on Chihuahuan desert wildlife sightings.

Joseph, Jamus; Collins, Michelle; Holechek, Jerry; Valdez, Raul; and Steiner, Robert
Western North American Naturalist 63(1): 43-49. (2003)
NAL Call #: QH1 .G7; ISSN: 1527-0904
Descriptors: Antilocapra americana/ Antilocapridae/ Artiodactyla/ Lepus californicus/ Sylvilagus auduboni/ Leporidae/ Lagomorpha/ Bos taurus/ Mammalia/ Zenaida macroura/ Columbiformes/ Callipepla squamata/ Galliformes/ Aves
Abstract: Seasonal wildlife observations were made along transects on 2 pastures conservatively grazed (36% use of perennial grasses) and 2 pastures moderately grazed (47% use of perennial grasses) in south central New Mexico in non-drought (1997) and drought years (1998). Experimental pastures were similar in soils, terrain, spacing of watering points, and brush cover. Average ecological condition score for the conservatively grazed pastures was 60% compared with 64% for moderately grazed pastures. Throughout the study total standing vegetation understory herbage levels were higher ($P < 0.05$) on conservatively grazed than moderately grazed pastures. Total wildlife, total gamebird, and total songbird sightings did not differ ($P > 0.05$) between conservatively and moderately grazed pastures. Black-tailed jackrabbit (*Lepus californicus*) sightings were higher ($P < 0.05$) on moderately grazed than conservatively grazed pastures. Sightings of pronghorn (*Antilocapra americana*), scaled quail (*Callipepla squamata*), mourning doves (*Zenaida macroura*), and desert cottontails (*Sylvilagus auduboni*) showed no differences ($P > 0.05$) between conservatively and moderately grazed pastures. Dry conditions in 1998 depressed total wildlife sightings by $> 50\%$ compared to 1997. Both songbird and gamebird (particularly mourning dove) sightings were severely reduced in the dry compared to wet year ($P < 0.05$). Our results are consistent with Nelson et al. (1997) that livestock grazing at intermediate levels had no effect on most Chihuahuan Desert upland wildlife species, and that drought years severely depress wildlife sightings.
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575. Cover for wildlife after summer grazing on Sandhills rangeland.

Reece, Patrick E.; Volesky, Jerry D.; and Schacht, Walter H.
Journal of Range Management 54(2): 126-131. (2001)
NAL Call #: 60.18 J82; ISSN: 0022-409X
http://jrm.library.arizona.edu/data/2001/542/126-131_reece.pdf
Descriptors: Bos taurus/ Galliformes/ Phasianidae/ tympnanuchus phasianellus/ birds/ ecosystems/ grasslands/ habitat use/ livestock/ nests/ nesting/ rangeland/ wildlife/ habitat relationships/ wildlife/ livestock relationships/ cattle/ sharp-tailed grouse/ foods/ feeding/ interspecies relations/ cover/ Aves/ USA/ Nebraska
Abstract: Livestock production and wildlife habitat objectives become antagonistic on grasslands when the architecture of standing herbage needed for key wildlife species limits the amount of forage that can be used by livestock. However, quantitative information needed to achieve cover objectives for wildlife is not available for summer-grazed grasslands. Three replicates of seven grazing treatments were applied to the same 1.0-ha pastures for three years. Treatments included ungrazed control, and grazing at 16, 32, or 48 animal unit days (AUD) ha⁻¹ for five to seven days during mid-June or mid-July. Cover was estimated after killing frost in September by measuring the average height below which complete visual obstruction occurred. Cumulative grazing pressure (AUD Mg⁻¹) was used to describe grazing effects because of measurable differences in herbage among pastures and dates. Grazing in June reduced the average height of autumn cover at a constant rate from 11.0 to 7.0 cm ($R^2 = 0.34$) as cumulative grazing pressure increased from 16 to 90 AUD Mg⁻¹. In contrast, declines in cover after grazing in July were about 2.6 times greater for cumulative grazing pressures up to 40 AUD Mg⁻¹ ($R^2 = 0.62$), indicating a measurable decline in plant growth and an increasing dependence of autumn cover on the remaining herbage when grazing ended. Relatively low predictability of autumn cover after June compared to July grazing was offset by more plant growth during the balance of the growing season. Frequency of low-cover patches (< 5.0 cm) within pastures was highly correlated ($R^2 = 0.94$) with mean estimates of autumn cover. Consequently, the quality of cover near potential nesting sites also declined as the average height of cover declined, regardless of grazing date. The interdependence of low-cover patches and mean visual obstruction indicates that either variable could be the primary criterion for nest site selection up to 12 cm in visual obstruction.
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576. Densities of brown-headed cowbirds in riparian and rangeland areas, with and without cattle present, along the Middle Rio Grande, New Mexico.

Tisdale Hein, Rinda E. and Knight, Richard L.
Studies in Avian Biology(26): 152-156. (2003)
NAL Call #: QL671.S8; ISSN: 0197-9922
Descriptors: brood parasitism/ cowbird management/ grazing/ habitat suitability/ livestock management/ rangeland habitat/ riparian habitat/ species density/ species distribution
Abstract: We compared the densities of total Brown-headed Cowbirds (*Molothrus ater*), female cow-birds, and potential hosts during the morning hours on grazed and

ungrazed riparian sites along the Rio Grande, New Mexico, in an attempt to evaluate the influence of the physical presence of cattle on these variables. In addition, we compared the densities of all cowbirds, female cowbirds, and potential hosts between morning and afternoon hours at riparian and rangeland sites, both with and without cattle present. We found no significant differences in total cowbird, female cowbird, or potential host densities during morning hours between riparian sites with and without cattle, indicating that the physical presence of cattle alone did not influence cowbird abundance or potential host abundance at our study sites. Cowbirds were absent from all of our riparian sites during the afternoon hours, indicating that habitat type and/or alternative feeding/congregation opportunities may have been more important in influencing cowbird densities during afternoon feeding periods than was the mere presence of cattle. Cowbird numbers in rangeland sites were low during both morning and afternoon periods, reflecting the low suitability of rangeland as cowbird breeding, and possibly feeding, habitat regardless of the presence of cattle. The lack of afternoon cowbird detections in both riparian and rangeland sites suggests that alternative feeding resources and/or congregation areas existed within the cowbird's commuting range. These findings have implications for current livestock management efforts to reduce cowbird parasitism of imperiled songbird species.
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577. Density and success of bird nests relative to grazing on western Montana grasslands.

Fondell, Thomas F. and Ball, I. J.
Biological Conservation 117(2): 203. (2004)
NAL Call #: S900.B5; ISSN: 0006-3207
Descriptors: brown-headed cowbird/ grassland/ grazing/ ground-nesting birds/ nest density/ prairie/ agriculture/ habitat/ habitat change/ change in vegetation/ brood/ egg/ fertility/ recruitment/ reproduction/ density
Abstract: Grassland birds are declining at a faster rate than any other group of North American bird species. Livestock grazing is the primary economic use of grasslands in the western United States, but the effects of this use on distribution and productivity of grassland birds are unclear. We examined nest density and success of ground-nesting birds on grazed and ungrazed grasslands in western Montana. In comparison to grazed plots, ungrazed plots had reduced forb cover, increased litter cover, increased litter depth, and increased visual obstruction readings (VOR) of vegetation. Nest density among 10 of 11 common bird species was most strongly correlated with VOR of plots, and greatest nest density for each species occurred where mean VOR of the plot was similar to mean VOR at nests. Additionally, all bird species were relatively consistent in their choice of VOR at nests despite substantial differences in VOR among plots. We suggest that birds selected plots based in part on availability of suitable nest sites and that variation in nest density relative to grazing reflected the effect of grazing on availability of nest sites. Nest success was similar between grazed plots and ungrazed plots for two species but was lower for nests on grazed plots than on ungrazed plots for two other species because of increased rates of predation, trampling, or parasitism by brown-headed cowbirds (*Molothrus ater*). Other species nested almost exclusively on ungrazed plots (six species) or grazed plots (one species), precluding

evaluation of the effects of grazing on nest success. We demonstrate that each species in a diverse suite of ground-nesting birds preferentially used certain habitats for nesting and that grazing altered availability of preferred nesting habitats through changes in vegetation structure and plant species composition. We also show that grazing directly or indirectly predisposed some bird species to increased nesting mortality. (Copyright 2004 Elsevier)
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578. Desert grassland canopy arthropod species richness: Temporal patterns and effects of intense, short-duration livestock grazing.

Forbes, G. S.; Van Zee, J. W.; Smith, W.; and Whitford, W. G.
Journal of Arid Environments 60(4): 627-646. (2005)
NAL Call #: QH541.5.D4J6; ISSN: 0140-1963
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579. Desert mule deer use of grazed and ungrazed habitats.

Ragotzkie, K. E. and Bailey, J. A.
Journal of Range Management 44(5): 487-490. (1991)
NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1991/445/15rago.pdf>
Descriptors: animals and man/ disturbance by man/ commercial activities/ nutrition/ feeding behaviour/ behaviour/ ecology/ habitat/ terrestrial habitat/ land and freshwater zones/ Nearctic Region/ North America/ USA/ *Odocoileus hemionus crooki* (Cervidae): farming and agriculture/ cattle grazing effects on habitat use within home ranges/ foraging/ home range/ habitat utilization/ grass/ shrubland habitats/ cattle grazing relationship/ grassland/ scrub/ grass/ shrubland/ Arizona/ Santa Rita Experimental Range/ habitat use in relation to cattle grazing/ grass/ shrublands/ Cervidae/ Artiodactyla/ Mammalia/ chordates/ mammals/ vertebrates
© The Thomson Corporation

580. Development of fall cattle grazing prescriptions to improve deer and elk forage.

Short, Jeffrey J. and Knight, James E.
Intermountain Journal of Sciences 5(1-4): 72. (1999); ISSN: 1081-3519
Abstract: [unedited] Cattle (*Bos taurus*) and wild ungulates have long been viewed as competitors. In the future the best method of preserving wildlife and cattle will be to manage them cooperatively. The objective of this project was to examine the use of fall cattle grazing to improve wildlife forage. We looked at the effects of four fall cattle grazing levels on elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*) forage. The hypothesis of this study is that fall cattle grazing will improve the quality of elk and deer forage the following spring and summer. The effects of fall foraging on wildlife forage were examined on the Blackfoot Clearwater Wildlife Management area in west central Montana. A randomized complete block design with five replications was used. Cattle were grazed in enclosures during the fall of 1997 and 1998. Grazing levels were zero percent removal (control) 50% removal, 70% removal, and 90% removal. During spring and summer we measured plant species composition, plant diversity, dead plant material, green forb biomass, and green grass biomass to evaluate quality of elk and deer forage. Preliminary data

from the first year of this two-year study suggests significant positive differences in wildlife forage due to cattle grazing intensity. Information generated will be useful in making management decisions on ranges that are important spring and summer wildlife habitat.
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581. Differential indirect effects of excluding livestock and rabbits from chalk heath on the associated leafhopper (Hemiptera: Auchenorrhyncha) fauna.

Barham, David Fisher and Stewart, Alan J. A
Journal of Insect Conservation 9(4): 351-361. (2005)
NAL Call #: QL362.J68; ISSN: 1366-638X

Descriptors: biogeography/ chalk heath vegetation/ grassland invertebrate assemblage

Abstract: Preliminary results are presented of sampling the leafhopper assemblages on a field experiment designed to examine the differential effects of rabbits and livestock (mainly sheep) on the vegetation of chalk heath in southern England. Experimental plots that excluded livestock either allowed entry by rabbits or excluded them. Results were compared with those from plots grazed by both livestock and rabbits. After 7 years, exclusion of grazing herbivores had resulted in predictable increases in vegetation height, but no major changes were detected in the species composition of the vegetation. As expected, ungrazed plots had higher species richness and greater abundances of several individual leafhopper species. However, plots grazed only by rabbits had a leafhopper assemblage that was distinct from either ungrazed or mixed grazing plots. It is suggested that rabbit grazing may have subtle effects on grassland invertebrate assemblages that are not necessarily predictable from an examination of the species composition of the vegetation. Chalk heath vegetation contains an unusual mixture of calcicole and calcifuge plant species, but the leafhopper assemblage included a restricted number of calcareous grassland specialist species and only one species strongly associated with acidic grasslands; most leafhoppers recorded were generalist grassland species.

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582. Direct impacts of cattle grazing on grassland nesting birds.

Churchwell, Roy; Davis, Craig A.; Fuhlendorf, Sam D.; and Engle, David M.

Bulletin of the Oklahoma Ornithological Society 38(4): 25-32. (2005); ISSN: 0474-0750

Descriptors: animals and man/ disturbance by man/ commercial activities/ reproduction/ reproductive behaviour/ ecology/ population dynamics/ habitat/ terrestrial habitat/ land zones/ nearctic region/ USA/ North America/ Aves: farming and agriculture/ cattle grazing/ direct impacts on nesting success/ breeding site/ nesting site/ reproductive productivity/ mortality/ trampling by cattle/ nesting on grassland/ grassland/ Oklahoma/ Osage County/ tallgrass prairie preserve/ nesting success/ direct impacts of cattle grazing/ Aves/ birds/ chordates/ vertebrates

Abstract: We used nest success data from a 2003 field season to examine the direct impacts of cattle grazing on grassland nesting birds. We found that 7% of nest loss was due directly to cattle through trampling of nests (6%) and abandonment (1%). We conclude that changes in grazing

management could mitigate the degree to which cattle directly impact nesting success of grassland birds, and discuss these suggestions in light of our results.

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583. Distribution of elk and cattle in a rest-rotation grazing system.

Knowles, C. J. and Campbell, R. B.

In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 47-60; 1982.

NAL Call #: SF84.84.W5 1981

Descriptors: Montana

This citation is from AGRICOLA.

584. Diversity and guild structure of insect assemblages under grazing and exclusion regimes in a montane grassland from central Argentina.

Cagnolo, L.; Molina, S. I.; and Valladares, G. R.

Biodiversity and Conservation 11(3): 407-420. (2002)

NAL Call #: QH75.A1B562; ISSN: 0960-3115

Descriptors: assemblage diversity/ biomass/ disturbance regimes/ exclusion regime/ grazing regime/ guild structure/ montane grassland/ species abundance/ species diversity/ species richness

Abstract: The effects of grazing disturbance on insect communities were examined at a montane grassland in Central Argentina, by comparing two grazed sites differing in cattle load (heavy and continuous or moderate and discontinuous) and two cattle exclusions differing in age (7 and 19 years). Two aspects of insect diversity (taxonomic and guild structure) and two levels of taxonomic resolution (family and species) were considered. Four monthly samples were taken with a suction sampler in two 1 m² areas at each site. Collected specimens were counted, identified to family (all insects) or species (Coleoptera) level, and allocated to trophic guilds. Abundance, richness, diversity and biomass of the insect assemblages had minimum values in the most intensely grazed habitat, which also differed from the other sites in terms of insect families and Coleoptera species composition. It also showed a distinct guild structure, with fewer secondary consumers, and chewers replacing suckers as the most abundant herbivore group. According to these observations, intense grazing in montane grasslands in Central Argentina could result in taxonomic and guild changes in the associated insect communities, but such effects would not be noticeable with less intensive use. Moreover, using family taxonomic level could be as or even more appropriate than species level in order to characterize insect communities in the studied habitats under varying disturbance regimes.

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585. Does extensive grazing benefit butterflies in coastal dunes?

Wallisdevries, Michiel F. and Raemakers, Ivo

Restoration Ecology 9(2): 179-188. (2001)

NAL Call #: QH541.15.R45R515; ISSN: 1061-2971

Descriptors: biodiversity/ coastal dunes/ grazing/ habitat quality/ management practices

Abstract: Grazing at low stocking rates has become a common management practice in nature restoration projects in the Netherlands. However, detailed knowledge

of grazing impact is often poor, in particular for invertebrates. This study addressed the impact of extensive grazing on butterflies. Butterflies are critical indicators of habitat quality for many plant and animal species. We compared monitoring data from 1992 to 1996 for calcareous coastal dune areas in the Netherlands with different management: 11 grazed areas, 7 ungrazed areas and 4 areas managed by annual cutting. Grazing typically concerned year-round grazing by cattle and/or ponies, at low stocking rates (0.05-0.26 head ha⁻¹ yr⁻¹). Butterfly abundance was related to species composition and structure of the vegetation. Changes in butterfly abundance were positive in grazed and ungrazed areas compared to cut areas. Species richness was not affected by management, but individual species differed in their response. Species from open grassland benefited most from grazing, particularly *Issoria lathonia* (Queen of Spain Fritillary) and *Lycaena phlaeas* (Small Copper). No clear negative effects of grazing were observed, but species occurrence was not always positively related to the environmental characteristics associated with grazing. In the long run, even lower stocking rates might prove more beneficial to the butterfly community as a whole. Four of the more frequently observed species, *I. lathonia*, *Hipparchia semele* (Grayling), *Pyrgus malvae* (Grizzled Skipper) and *Aricia agestis* (Brown Argus), are listed as threatened to susceptible in the Netherlands. All were apparently favored by grazing. It is concluded that extensive grazing has good potential to enhance butterfly diversity in restoration projects.

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586. Does grazing influence bee diversity?

Mayer, Carolin

In: African biodiversity: Molecules, organisms, ecosystems/ Huber, B. A.; Sinclair, B. J.; and Lampe, K. H. New York: Springer, 2005; pp. 173-179.

Notes: Meeting Information: 5th International Symposium on Tropical Biology, Bonn, GERMANY; 200405; ISBN 0387243151

NAL Call #: QH194 .I497 2004

Descriptors: species diversity/ species abundance/ livestock grazing

Abstract: In Namaqualand, the north-western part of the Succulent Karoo of South Africa, a study was conducted to investigate the influence of livestock grazing on the abundance and diversity of bees (superfamily Apoidea). Bees were collected on adjacent rangeland sites which are characterized by a significant fence line contrast, one site showing effects of heavy grazing. Application of different sampling methods (Malaise and colour plate trapping) reveal different results, indicating that methodological influences are significant. Colour traps, in particular, may provide poor estimates of bee abundance due to their apparent sensitivity to competition from surrounding flowers for insect attraction.

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587. Duck nesting on rotational and continuous grazed pastures in North Dakota.

Murphy, Robert K.; Schindler, Darrell J.; and Crawford, Richard D.

Prairie Naturalist 36(2): 83-94. (2004)

NAL Call #: QH540 .P7; ISSN: 0091-0376

Descriptors: visual obstruction reading: VOR, applied and

field techniques/ Prairie Pothole Joint Venture [PPJV]/ continuous grazed pastures/ nest density/ nest success/ nesting habitat/ prairie habitat conservation/ rotational cattle grazing/ rotational grazed pastures

Abstract: To improve the economic viability of grazed prairie and thus conserve it as wildlife habitat, the Prairie Pothole Joint Venture (PPJV) cost-shares establishment of rotational cattle grazing on privately owned, native rangeland. During 1996 and 1997 we evaluated duck nest density, nest success, and nesting habitat on six PPJV rotational grazed pastures on the Missouri Coteau landform in central and northwestern North Dakota. Each rotational pasture was paired with a traditional, continuous grazed pasture for comparison. We located 444 nests of eight duck species. We detected no differences ($P > 0.1$) between rotational and continuous grazed pastures in apparent nest density of ducks ($\bar{x} \pm SD$ nests/ha, all species combined, 1996: 0.26 \pm 0.09 and 0.31 \pm 0.12; 1997: 0.38 \pm 0.14 and 0.25 \pm 0.12), although a grazing type \times year interaction suggested rotational pastures might be more attractive to ducks in a dry spring (1997). No differences in duck nest success were detected between rotational and continuous pastures (% Mayfield estimate, 1996: 27.2 \pm 12.6 and 15.5 \pm 11.0; 1997: 21.6 \pm 10.0 and 16.7 \pm 13.7), but varied occurrence of canid species could have obscured differences. We detected no differences in vegetation height-density indices as measured by visual obstruction readings (VORs) between rotational and continuous pastures in 1996. VORs were greater on rotational pastures, however, in the relatively dry spring of 1997. Our findings suggested that rotational grazing systems can serve as a prairie conservation tool on private rangelands without altering habitat values for nesting ducks, and in relatively dry springs might provide more attractive nesting cover for ducks than prairie under continuous grazing.

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588. Economic tradeoffs between livestock grazing and wildlife habitat: A ranch-level analysis.

Bernardo, Daniel J.; Boudreau, Gregory W.; and Bidwell, Terrance C.

Wildlife Society Bulletin 22(3): 393-402. (1994)

NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: habitat/ hunting lease/ land resources/ modeling framework/ public grazing lands/ vegetation management

Abstract: Multiple-use management of land resources for domestic livestock and wildlife is becoming an increasingly important issue on private and public lands. A modeling framework is presented to develop production plans which maximize returns from livestock grazing and meet deer and quail habitat constraints on private rangelands in Oklahoma. In the initial solution of the model, net returns are maximized from cattle grazing without concern for wildlife habitat. An intensive vegetation management program involving herbicides and prescribed burning is used to reduce forage diversity (forbs, legumes, and woody shrubs) and maximize grass production for cattle grazing. Low to moderate deer and quail habitat ratings are associated with this plan. Optimal plans to achieve incremental increases in target quail and deer habitat ratings include strip application of herbicide, fall burning, and some mechanical removal of hardwoods to produce a mosaic of small open prairie areas and wooded areas.

Brush piles and disking of small portions of the prairie areas are used to improve food diversity and protective cover. Only small reductions in income from livestock production are required to attain initial improvements in quail and deer habitat ratings; however, further improvements translate to more significant income reduction. While habitat appraisal models provide means of quantifying habitat considerations in economic optimization models, several limitations still exist. First, additional research is needed to verify the positive relationship between wildlife habitat and population and to determine the relationship between hunting lease values and habitat quality. Application of the model requires rather meticulous detail in specifying the effects of various management practices on forage production and wildlife habitat. These data are not available for all areas; however, such information is required to develop efficient multiple-use management strategies (Matulich and Adams 1987). Also, the analysis does not consider the influence of dynamics or risk on decision making. Manipulation of vegetation is a dynamic process that may occur over several years and is significantly influenced by climatic events. Risk caused by price volatility and other sources of uncertainty may also influence ranch plans. Improvements to the model should focus on these considerations. While the findings are somewhat site specific, the study does present a useful and transferable framework for simultaneously analyzing livestock management and wildlife habitat decisions. The model can be specified to accommodate alternative livestock enterprises, vegetation management treatments, and habitat improvement practices for which the required technical data are available. The model may be expanded to incorporate additional wildlife species and is adaptable to accommodate alternative wildlife habitat evaluation systems. While probably more applicable to decision making on private lands, this model could also be applied to public grazing lands.

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589. Effect of cattle grazing on the density and species of grasshoppers (Orthoptera: Acrididae) of the Central Plains Experimental Range, Colorado: A reassessment after two decades.

Welch, J. L.; Redak, R.; and Kondratieff, B. C.
Journal of the Kansas Entomological Society 64(3): 337-343. (1991)
 NAL Call #: 420 K13; ISSN: 0022-8567
 Descriptors: animals and man/ disturbance by man/ commercial activities/ ecology/ habitat/ terrestrial habitat/ land and freshwater zones/ Nearctic Region/ North America/ USA/ Acrididae (Saltatoria): farming and agriculture/ cattle grazing effects on community structure/ community structure/ cattle grazing effects/ grassland/ Colorado/ Nunn/ grassland community structure/ effect of cattle grazing/ long term changes/ Saltatoria/ Orthoptera/ Insecta/ arthropods/ insects/ invertebrates

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590. Effect of cattle stocking rate on the nutritional ecology of white-tailed deer in managed forests of southeastern Oklahoma and southwestern Arkansas.

Jenks, Jonathan Oklahoma State University, 1992.
 Descriptors: *Odocoileus virginianus*/ livestock/ food supply/ interspecific relations/ feeding behavior/ nutrition/ grazing/

habitat alterations/ wildlife/ livestock relationships/ North America/ United States/ Arkansas: Pike County/ Arkansas: Howard County/ Oklahoma: McCurtain County
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591. Effect of grazing by sheep on the quantity and quality of forage available to big game in Oregon's Coast Range.

Rhodes, B. D. and Sharrow, S. H.
Journal of Range Management 43(3): 235-237. (1990)
 NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1990/433/13rhod.pdf>
 Descriptors: sheep/ digestibility/ *Odocoileus*/ *Cervus elaphus*/ forest plantations/ *Pseudotsuga menziesii*/ grazing/ *Odocoileus hemionus*/ Oregon
 This citation is from AGRICOLA.

592. The effect of grazing on the abundance and diversity of birds in scrub vegetation at Nathdwara Rajasthan.

Gaston, A. J.
Journal of the Bombay Natural History Society 83(1): 214-217. (1986)
 NAL Call #: 513 B63; ISSN: 0006-6982
 Descriptors: pasture/ species richness
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593. The effect of grazing on the land birds of a western Montana riparian habitat.

Mosconi, S. L. and Hutto, R. L.
 In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 221-233; 1982.
 NAL Call #: SF84.84.W5 1981
 This citation is from AGRICOLA.

594. The effect of heather fragmentation and mixed grazing on the diet of sheep *Ovis aries* and red deer *Cervus elaphus*.

Cuartas, Paloma; Gordon, Iain J.; Hester, Alison J.; Perez Barberia, F. Javier; and Hulbert, Ian A. R.
Acta Theriologica 45(3): 309-320. (2000)
 NAL Call #: 410 AC88; ISSN: 0001-7051
 Descriptors: fecal cuticle analysis: analytical method/ diet composition/ heather moorland: habitat/ mixed grazing/ mosaic pattern/ vegetation fragmentation
 Abstract: The effects of vegetation fragmentation and mixed grazing (ie mono- or multi-species animal group) on the diet composition of sheep and red deer grazing mosaics of grassland and heather moorland was studied, using faecal cuticle analysis, in two experimental sites in Scotland during the summer of 1992 and 1993. On Site A, the influence of grassland fragmentation on diet composition was estimated for sheep and deer grazing together in plots where the grassland (20% of the area) was artificially distributed as one large, four medium or twelve small patches within a homogeneous moorland matrix (80% of the area). On Site B, differences in diet composition between animals grazing within mono-species (sheep or deer) and multi-species groups (sheep and deer together) were examined for each animal species. In this site all plots used contained a similar natural mosaic pattern of grass and heather (ie similar mixtures of patch sizes, with about

20% grass and 80% heather cover). On Site A, the proportions of grass in the diet of sheep (73%) and deer (27%) were found to be similar across all levels of grass fragmentation. A significant interaction was found between the pattern of fragmentation and the three periods in which the experiment was carried out. On Site B in 1992, sheep had more grass in their diet than did deer (52% vs 46%), and the diets of both sheep and deer responded in the same fashion when the species were grazing in mono- or multi-species groups. The consumption of grass decreased in both species throughout the period studied. Deer showed no change in the proportion of grass in their diet in the presence or absence of sheep in 1992 (deer 48% vs sheep 50%). But on Site B in 1993, the diet of sheep contained a significantly higher proportion of grasses when they were grazing with red deer (52%) than when they were grazing alone (38%). These results suggest that on grassland/heather moorland mosaics sheep may suffer intraspecies competition to a greater extent than do red deer, particularly where grass is in relatively low supply.
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595. The effect of livestock grazing upon abundance of the lizard, *Sceloporus scalaris*, in southeastern Arizona.

Bock, Carl E.; Smith, Hobart M.; and Bock, Jane H. *Journal of Herpetology* 24(4): 445-446. (1990)
NAL Call #: QL640.J6; ISSN: 0022-1511
Descriptors: *Sceloporus scalaris*/ amphibians/ reptiles/ behavior/ grazing/ habitat alterations/ habitat use/ predator/ prey relationships/ predators
© NISC

596. Effect of sheep grazing and fire on sage grouse populations in southeastern Idaho.

Pedersen, E. K.; Connelly, J. W.; Hendrickson, J. R.; and Grant, W. E. *Ecological Modelling* 165(1): 23-47. (2003)
NAL Call #: QH541.15.M3E25; ISSN: 0304-3800
Descriptors: difference equation: mathematical and computer techniques/ discrete time stochastic compartment model: mathematical and computer techniques/ simulation model: mathematical and computer techniques/ biomass/ breeding habitats/ canopy growth/ community ecology/ fire frequency/ grazing effects/ habitat mosaics/ historical environmental conditions/ long term trends/ population dynamics/ sagebrush vegetation/ seasonal dynamics
Abstract: This paper describes the development, evaluation, and use of a model that simulates the effect of grazing and fire on temporal and spatial aspects of sagebrush community vegetation and sage grouse population dynamics. The model is represented mathematically as a discrete-time, stochastic compartment model based on difference equations with a time interval of 1 week. In the model, sheep graze through sage grouse breeding habitat during spring and fall, and different portions of the area can burn at different frequencies, creating a habitat mosaic of burned and unburned areas. The model was evaluated by examining predictions of (1) growth of sagebrush canopy cover after fire, (2) seasonal dynamics of grass and forb biomass under historical environmental conditions, and (3) sage grouse population dynamics associated with selected sagebrush canopy covers. Simulated changes in sagebrush canopy cover following fire correspond well with qualitative reports of

long-term trends, simulated seasonal dynamics of herbaceous biomass correspond well with field data, and simulated responses of sage grouse population size and age structure to changing sagebrush canopy cover correspond well to qualitative field observations. Simulation results suggest that large fires occurring at high frequencies may lead to the extinction of sage grouse populations, whereas fires occurring at low frequencies may benefit sage grouse if burned areas are small and sheep grazing is absent. Sheep grazing may contribute to sage grouse population decline, but is unlikely to cause extinction under fire regimes that are favorable to sage grouse.
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597. The effect of two years of livestock grazing enclosure upon abundance in a lizard community in Baja California Sur, Mexico.

Romero-Schmidt, Heidi; Ortega-Rubio, Alfredo; Arguelles-Mendez, Cerafina; Coria-Benet, Rocio; and Solis-Marin, Francisco
Chicago Herpetological Society Bulletin 29(1): 245-248. (1994); ISSN: 0009-3564
Descriptors: North America/ Mexico: Baja California Sur
© NISC

598. Effect of water and nitrogen, and grazing on nematodes in a shortgrass prairie.

Smolik, J. D. and Dodd, J. L. *Journal of Range Management* 36(6): 744-748. (1983)
NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1983/366/17smol.pdf>
This citation is from AGRICOLA.

599. Effects of a savory grazing method on big game: A final report.

Brown, R. L. Arizona Game and Fish Dept., 1990. 58 p. Arizona Game and Fish Department Wildlife Bulletin.
Notes: ISSN: 0518-5467
Descriptors: cattle/ deer, mule/ elk/ feeding method/ fences/ food habits/ food supply/ game, big/ grazing/ history/ hunting/ movements/ population density/ pronghorn/ wildlife-habitat relationships/ wildlife-livestock relationships
Abstract: Elk, mule deer, and pronghorn antelope use levels were monitored within a radial design holistic resource management cell, and an adjacent set of rest-rotation pastures that were grazed by cattle during the summer months. A discussion of requirements for effective wildlife goals is included.
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600. Effects of an 11-year livestock enclosure on rodent and ant numbers in the Chihuahuan Desert, southeastern Arizona.

Heske, E. J. and Campbell, M. *Southwestern Naturalist* 36(1): 89-93. (1991)
NAL Call #: 409.6 SO8; ISSN: 0038-4909
Descriptors: small mammals/ livestock/ pastures/ ecology/ trampling/ grazing/ interactions
Abstract: Rodents were censused, ant colonies counted, and vegetative structure measured along 11 pairs of transects at a Chihuahua Desert study site in southeastern Arizona. One member of each pair of transects was inside and one was outside of a 20-ha livestock enclosure that had been in place for 11 years. Vegetative structure did not

differ between transects exposed to or protected from cattle grazing, but significantly more rodents were captured inside the enclosure. However, only a subset of the rodent species present, primarily *Dipodomys*, were negatively affected by the presence of cattle. Ant colonies were equally abundant on transects inside and outside of the enclosures, indicating that ants are more resistant than rodents to trampling and potential competition for food with cattle.

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601. The effects of burning and grazing on habitat use by whooping cranes and sandhill cranes on the Aransas National Wildlife Refuge.

Hunt, Howard Emery Texas A&M University, 1987.

Descriptors: *Grus canadensis/ Grus americana/ habitat disturbance [fire]/ livestock/ Texas*

© NISC

602. Effects of cattle grazing on ecology and habitat of Columbia Basin pygmy rabbits (*Brachylagus idahoensis*).

Thines, Nicole J. Siegel; Shipley, Lisa A.; and Saylor, Rodney D.

Biological Conservation 119(4): 525-534. (2004)

NAL Call #: S900.B5; *ISSN:* 0006-3207

Descriptors: Columbia Basin/ commercial enterprises/ conservation/ disturbances/ ecosystems/ endangered/ threatened species/ farming and agriculture/ grasslands/ habitat use/ land zones/ nearctic region/ North America/ shrub grasslands/ shrub-steppe habitat/ USA/ Washington/ wildlife management/ wildlife/ human relationships/ Columbia Basin pygmy rabbit

Abstract: Dramatic declines in the endangered Columbia Basin pygmy rabbit, a genetically unique population of small, burrowing rabbits in Northwestern United States, are likely the combined results of habitat degradation and fragmentation, disease, and predation. A critical component of pygmy rabbit habitat includes big sagebrush (*Artemisia tridentata*), which constitutes 82-99% of their winter diet and 10-50% of their summer diet. Sagebrush also forms the bulk of hiding cover around burrow sites. Across the range of pygmy rabbits, sagebrush habitat is grazed extensively by cattle. However, grazing has unknown effects on pygmy rabbits inhabiting the remaining, fragmented shrub-steppe habitat. We evaluated the effects of four grazing treatments on the distribution of pygmy rabbit burrows, diets of pygmy rabbits, and quality and quantity of vegetation at Sagebrush Flat in central Washington. Ungrazed areas contained significantly more burrows per unit area than did grazed areas. Vegetation composition and structure differed little among treatments in early summer before annual grazing by cattle. However, cattle grazing in late summer through winter removed about 50% of the grass cover, and reduced the nutritional quality (e.g., increased fiber and decreased protein) of the remaining grass. Although pygmy rabbits ate <2% grasses in winter, grasses and forbs comprised 53% of late summer diets. Because these endangered rabbits avoided grazed areas, removing cattle grazing from key habitat locations may benefit efforts to restore this rabbit in Washington. Copyright 2004 Elsevier Ltd. All rights reserved.

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603. Effects of cattle grazing on mule deer diet and area selection.

Austin, Dennis D. and Urness, Philip J.

Journal of Range Management 39(1): 18-21. (1986)

NAL Call #: 60.18 J82; *ISSN:* 0022-409X

<http://jrm.library.arizona.edu/data/1986/391/5aust.pdf>

Descriptors: *Odocoileus hemionus/ grazing/ habitat alterations/ habitat use/ wildlife/ livestock relationships/ deer, mule/ enclosures and exclosures/ food habits/ grasses/ habitat/ production/ proteins/ utilization/ vegetation/ wildlife-livestock relationships/ North America/ United States/ Utah/ western region/ Sheeprock Mountains*
Abstract: Split enclosures, half grazed and half ungrazed by cattle in summer, were compared for mule deer habitat use in late summer using tame deer. Diet composition, dietary nutrition, and area selected for grazing were used as criteria.

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604. The effects of cattle grazing on optimal foraging in mule deer (*Odocoileus hemionus*).

Kie, John G.

Forest Ecology and Management 88(1-2): 131-138. (1996)

NAL Call #: SD1.F73; *ISSN:* 0378-1127

Descriptors: animal husbandry/ climate/ competition/ ecology/ foraging/ grazing/ stocking level

Abstract: A previous study of different cattle stocking rates on activity patterns of female mule deer (*Odocoileus hemionus*) on summer range in California found that deer spent more time feeding and less time resting with increased cattle stocking rates (Kie et al., 1991). During a year of normal precipitation, deer spent more time feeding per day in late summer than in early summer in pastures grazed by cattle. In a drier year, deer spent less time feeding per day in late summer in grazed pastures. Deer increased their time spent feeding by including more feeding bouts each day, not by increasing the length of each foraging bout. Deer were also reluctant to forage at night, particularly when there was a full moon. Based on these results, we hypothesized that female mule deer act as time-minimizers when forage conditions are good, but shift to a energy-maximizing strategy when forage conditions are poor (Kie et al., 1991). Preliminary results from subsequent research on black-tailed deer (*O. h. columbianus*) on Mediterranean-climate, foothill winter range found that deer acted as energy-maximizers and spent less time feeding with increasing cattle stocking rates during the fall and early winter when herbaceous forage was in limited supply. After mid-January when herbaceous plants began growing rapidly there appeared to be no competition for forage between deer and cattle, and increased cattle stocking rates had no effect on the time spent foraging by deer. These results were consistent with the original hypothesis.

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605. Effects of cattle grazing on passerine birds nesting in riparian habitat.

Taylor, D. M.

Journal of Range Management 39(3): 254-258. (1986)

NAL Call #: 60.18 J82; *ISSN:* 0022-409X

<http://jrm.library.arizona.edu/data/1986/393/16tayl.pdf>

Descriptors: grazing/ cattle/ birds/ habitats/ population density/ *Salix/ riparian buffers/ Oregon*

This citation is from AGRICOLA.

606. Effects of cattle grazing on salt desert rodent communities.

Jones, Allison L. and Longland, William S.
American Midland Naturalist 141(1): 1-11. (1999)
NAL Call #: 410 M58; ISSN: 0003-0031
Descriptors: live trapping: monitoring method/ grazing/ home range size/ microhabitat use/ relative abundance/ salt desert shrub community
Abstract: Cattle grazing has been shown to alter various features of desert communities that may impact microhabitats required by various species of desert rodents, with unknown implications for desert rodent communities. We conducted a series of studies at heavily and lightly grazed sites to investigate effects of cattle grazing on desert rodent relative abundances, home range sizes and microhabitat use in salt desert shrub communities of the western Great Basin Desert. Monitoring of rodent populations with repeated live trapping showed that different levels of grazing were associated with differences in relative abundances of some species of rodents. Specifically, *Dipodomys merriami* was significantly more abundant in heavily grazed areas, and *Perognathus longimembris* was significantly more abundant in lightly grazed areas. Our studies showed that cattle, by preferentially feeding on certain plants, can create conditions that are more suitable for some species of rodents, while reducing important microhabitat for other species.
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607. Effects of cattle grazing systems on shrub-grassland birds in south Texas.

Swanson, Douglas Wayne Texas A&M University, 1988.
Descriptors: behavior/ birds/ communities/ ecosystems/ habitat alterations/ grazing/ habitat use/ shrub grasslands/ North America/ United States/ Texas/ Texas, southern
© NISC

608. Effects of cattle grazing upon chemical constituents within important forages for elk.

Dragt, W. J. and Havstad, K. M.
Northwest Science 61(2): 70-73. (1987)
NAL Call #: 470 N81; ISSN: 0029-344X
Descriptors: *Agropyron spicatum*/ *Festuca scabrella*/ *Festuca idahoensis*/ *Cervus elaphus Nelsoni*/ deferred rotation/ cattle management/ forage management/ seasonality/ indirect competition/ amensalism/ elkhorn/ mountains/ Montana/ USA
Abstract: On many western rangelands, cattle and elk use the same forages but during different seasons. This can place these species into indirect competition or amensalism. The objective of this study was to examine the effects of summer grazing by cattle upon the winter forage quality for elk. Individual plants of bluebunch wheatgrass (*Agropyron spicatum*), rough fescue (*Festuca scabrella*), and Idaho fescue (*Festuca idahoensis*) were monitored for phenological stage when summer grazed by cattle on a Rocky Mountain elk (*Cervus elaphus nelsoni*) wintering range in the Elkhorn Mountains, Montana. Assessment of winter chemical composition of these three key forage species indicated no deleterious effects of summer grazing by cattle stocked at 3.7 ha/AUM upon the winter forage quality. In general, rough fescue and Idaho fescue had lower average fiber fractions and higher crude protein than

bluebunch wheatgrass. Under deferred rotation cattle management, the primary winter elk forage management concern appears to be forage quantity rather than quality.
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609. Effects of continuous grazing on habitat and density of ground-foraging birds in south Texas.

Baker, D. L. and Guthery, F. S.
Journal of Range Management 43(1): 2-5. (1990)
NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1990/431/1bake.pdf>
Descriptors: cattle/ habitats/ birds/ *Colinus virginianus*/ population density/ grazing/ sandy loam soils/ clay soils/ grazing intensity/ Texas
This citation is from AGRICOLA.

610. Effects of distance from cattle water developments on grassland birds.

Fontaine, A. L.; Kennedy, P. L.; and Johnson, D. H.
Journal of Range Management 57(3): 238-242. (May 2004)
NAL Call #: 60.18 J82; ISSN: 0022-409X
Descriptors: songbirds/ population density/ population dynamics/ cattle production/ range management/ water distribution/ prairies/ grazing intensity/ *Eremophila*/ *Passeriformes*/ plant strata/ height/ canopy/ plant litter/ botanical composition/ North Dakota
Abstract: Many North American grassland bird populations appear to be declining, which may be due to changes in grazing regimes on their breeding areas. Establishment of water developments and confining cattle (*Bos taurus* L.) to small pastures often minimizes spatial heterogeneity of cattle forage consumption, which may lead to uniformity in vegetative structure. This increased uniformity may provide suitable habitat for some bird species but not others. We assessed how cattle use, vegetative structure, and bird population densities varied with increasing distance from water developments (0-800 m) on the Little Missouri National Grassland (LMNG) in North Dakota. Lark buntings (*Calamospiza melancorys Stejneger*), which are typically associated with low vegetative cover, decreased with increasing distance from water developments. Horned larks (*Eremophila alpestris* L.), also a low-cover associate, followed a similar but weaker trend. Densities of another low-cover associate as well as moderate- and high-cover associates were not related to distance from water. Vegetative height-density and litter depth increased by 50 and 112%, respectively, while cowpie cover and structural variability decreased by 51 and 24%, respectively, with distance from water. Confidence interval overlap was common among all measures, showing substantial variability among study sites. Our results indicate cattle use is higher closer to water developments, and this pattern may positively affect the densities of lark buntings and horned larks. The absence of density gradients in the other bird species may be due to the paucity of locations > 800 m from water on the LMNG.
This citation is from AGRICOLA.

611. The effects of fall grazing or burning bluebunch wheatgrass range on forage selection by deer and cattle in spring.

Willms, W.; Bailey, A. W.; McLean, A.; and Tucker, R. *Canadian Journal of Animal Science* 60(1): 113-122. (1980)
NAL Call #: 41.8 C163; ISSN: 0008-3984

Descriptors: *Odocoileus hemionus hemionus/ Odocoileus hemionus/ fires/ burns/ grazing/ habitat alterations/ mule deer/ food*

© NISC

612. Effects of fire management and grazing by cattle on ant communities in south-east Queensland open forests.

Vanderwoude, Cas and Johnson, Kym M. In: *Conservation of Australia's forest fauna/ Lunney, Daniel. Mosman: Royal Zoological Society of New South Wales, 2004; pp. 860-874.*

Notes: ISBN: 095860858X

Descriptors: *animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ ecology/ habitat/ terrestrial habitat/ abiotic factors/ physical factors/ land zones/ Australasian Region/ Australasia/ Australia/ Formicidae: farming and agriculture/ cattle grazing/ habitat management/ open forests management/ community structure/ fire management and cattle grazing effects/ forest and woodland/ fire/ Queensland/ Bauple State Forest/ fire management and cattle grazing effects on communities/ open forests/ Formicidae/ Formicoidea/ Aculeata/ Apocrita/ Hymenoptera/ Insecta/ arthropods/ hymenopterans/ insects/ invertebrates*

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613. Effects of forest management and grazing on breeding bird communities in plantations of broadleaved and coniferous trees in western England.

Donald, P. F.; Fuller, R. J.; Evans, A. D.; and Gough, S. J. *Biological Conservation* 85(1-2): 183-197. (1998)
NAL Call #: S900.B5; ISSN: 0006-3207

Descriptors: *bird abundance/ breeding bird communities/ forest management/ grazing pressure/ plantation forestry/ species richness/ stand age/ stand size/ tree species composition*

Abstract: Management options in commercial forestry include choice of conifers or broadleaves, rotation length, stand size and grazing regime. Each factor potentially affects the conservation value of woodland for birds. Relationships between these factors and the structure and composition of breeding bird communities were examined in 69 stands distributed across a range of plantations composed of predominantly native broadleaved and non-native coniferous trees in the Forest of Dean, western England, in 1992 and 1993. Each stand was classified as one of three high forest types: broadleaved, coniferous or mixed broadleaves and conifers. Stand size had no effect on bird communities. Species richness and overall bird abundance increased with forest age when all forest types were combined. Within stands of similar ages, there were no consistent differences in species richness or overall bird abundance between the three forest types or between grazed and ungrazed stands. However, bird communities in mixed stands were intermediate in their overall species composition to those in broadleaved and coniferous stands. Regression and gradient analyses (CCA and PCA)

revealed that major gradients in the species composition of the bird communities were associated with stand age and with tree species composition. The proportion of individuals contributed by hole-nesting species was higher in broadleaved than coniferous stands and increased with stand age. The proportion of individuals contributed by migrants was higher in especially the early years, but also in the late years of the rotation. The proportion of migrants was higher in ungrazed than in grazed stands and increased with openness of the canopy and development of low vegetation. The diversity of stands in terms of tree sizes and tree species was positively correlated with both number of bird species and overall bird abundance. The relevance of these findings is discussed in relation to the integration of bird conservation into coniferous forestry, focusing particularly on the value of broadleaved stands and the effects on bird communities of stand structure and grazing pressure.

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614. The effects of grassland management using fire on habitat occupancy and conservation of birds in a mosaic landscape.

Pons, Pere; Lambert, Bernard; Rigolot, Eric; and Prodon, Roger

Biodiversity and Conservation 12(9): 1843-1860. (2003)
NAL Call #: QH75.A1B562; ISSN: 0960-3115

Descriptors: *canonical correspondence analysis: mathematical and computer techniques/ prescribed burning: applied and field techniques/ conservation biology/ cover types/ environmental variables/ grassland management/ grazing intensity/ habitat occupancy/ habitat selection/ habitat structure/ mosaic landscapes/ mountain rangelands: habitat/ pastoral value/ shrub volume/ species composition*

Abstract: Prescribed burning is routinely used to improve grazing in Pyrenean rangelands affected by an overall trend of land abandonment. This study considers the environmental variables influencing habitat occupancy by birds and the consequences of the use of fire in range management for bird conservation. Bird use and habitat structure of 11 cover types, the result of specific management regimes, were monitored for two breeding seasons in a mosaic landscape. Three main gradients of avian composition, corresponding to tree cover, shrub volume and grazing intensity, were identified from canonical correspondence analysis. The structure of the bird community seemed more intensely affected by species-specific selection of cover types than by the birds' use of multiple patches. Out of a total of 10 bird species analysed by a simultaneous confidence intervals procedure, four species with an unfavourable conservation status in Europe (*Emberiza cia*, *Lullula arborea*, *Saxicola torquata* and *Lanius collurio*) preferred managed grassland. Three types of grassland with shrubs (derived from single or repeated burning) had the highest bird conservation index (taking into account specific status and abundance of the bird assemblage), whereas forests showed middle or low values. The relation ($P=0.054$) of this index to the logarithm of the pastoral value (which includes density and grazing quality of grasses) in currently managed cover types suggests that the objectives of grassland recovery by appropriate management practices and those of bird conservation coincide in our study area.

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615. The effects of grazing and browsing animals on wildlife habitats.

Urness, P. J. and Austin, D. D.

Utah Science 50(2): 104-107. (1989)

NAL Call #: 100 Ut1F

Descriptors: grassland management/ grasslands/ rangelands/ grazing/ nature conservation

Abstract: The effects of stocking different species of animal on rangelands in Utah, USA, is discussed, with particular reference to the possible impact on wildlife through alteration of their habitat.

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616. Effects of grazing and burning on densities and habitats of breeding ducks in North Dakota.

Kruse, Arnold D. and Bowen, Bonnie S.

Journal of Wildlife Management 60(2): 233-246. (1996)

NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: land use/ Lostwood National Wildlife Refuge/ native grasslands/ nest density/ nest success/ seasonality/ wildlife management

Abstract: Native grassland communities controlled by public agencies become increasingly important to the maintenance of many wildlife species as privately owned grasslands are destroyed or degraded for farming, mining, and development. In turn, wildlife on publicly owned grasslands are affected by the management techniques practiced by local managers. We studied the effects of grazing and prescribed burning on upland-nesting ducks and the structure and type of vegetation from 1980 to 1988 at the Lostwood National Wildlife Refuge (NWR) in northwestern North Dakota. Mallard (*Anas platyrhynchos*), the most abundant species at Lostwood NWR, had lower ($P < 0.05$) annual nest densities on experimental and control fields in the later years than in the early years of the study. Spring burning reduced ($P = 0.016$) nest densities of gadwall (*A. strepera*). Spring grazing reduced nest densities of gadwall ($P = 0.014$), and blue-winged teal (*A. discors*, $P = 0.023$). Nest density of gadwall increased ($P = 0.018$) after spring grazing was terminated. On the summer burn/spring graze fields, blue-winged teal had lower ($P = 0.010$) nest densities after treatments (1987-88) than before treatments (1980-81). Nest success was high (mallard 34%, gadwall 45%, blue-winged teal 31%) but was not influenced ($P > 0.16$) by the burning and grazing treatments. During the study, the amount of grass/brush increased, whereas the amount of brush and brush/grass decreased on control and treatment fields. During the years with burning and grazing, short vegetation increased and tall vegetation decreased. On the spring graze fields, 1 year after grazing ended the vegetation was similar to that on the control fields. The spring burn and summer burn/spring graze fields recovered more slowly. Brushy species such as western snowberry (*Symphoricarpos occidentalis*) provided attractive nesting habitat for many upland-nesting waterfowl species, especially mallard, gadwall, American wigeon (*A. americana*), and northern pintail (*A. acuta*). Habitat needs of additional species of wildlife that depend on grasslands may need to be considered when deciding how to manage habitat.

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617. Effects of grazing intensity and temporal application of grazing treatments of nongame birds in North Dakota mixed-grass prairie.

Salo, Eric D. South Dakota State University, 2003.

Notes: A thesis submitted in partial fulfillment of the requirements for the degree Master of Science Major in Wildlife and Fisheries Sciences (Wildlife Option), South Dakota State University

<http://wfs.sdstate.edu/wfsdept/Publications/Theses/Salo,%20Eric%20D.%20MS-2003.pdf>

618. Effects of grazing intensity on small mammal population ecology in wet meadows.

Schmidt, Niels M.; Olsen, Henrik; Bildsoe, Mogens; Sluydts, Vincent; and Leirs, Herwig

Basic and Applied Ecology 6(1): 57-66. (2005)

NAL Call #: QH540 .B37; ISSN: 1439-1791

Descriptors: animals and man/ disturbance by man/ commercial activities/ reproduction/ reproductive productivity/ ecology/ habitat/ land zones/ Palaearctic Region/ Eurasia/ Europe/ Mammalia: farming and agriculture/ grazing intensity/ effects on population dynamics/ embryo number/ biomass/ population dynamics/ semiaquatic habitat/ Denmark/ Funningo Manor/ wet meadows/ biomass and foetal number/ effects of grazing intensity/ small taxa/ Mammalia/ chordates/ mammals/ vertebrates

Abstract: Livestock grazing is common management practice in wet grasslands. However, knowledge of its effects on small mammals is limited. We studied the influence of grazing intensity on small mammals in general and field votes *Microtus agrestis* in particular in two Danish wet meadows, 1998-2000. Generally, grazing livestock had a negative effect on the peak biomass of small mammals, and the negative effect increased with grazing intensity, irrespective of whether pens were grazed by cattle or by sheep. More detailed analyses, however, revealed that an intermediate grazing as maximum livestock biomass actually seemed intensity (approximately 400 kg ha⁻¹ to benefit small mammals. This grazing intensity generally held small mammal biomasses and field vote population sizes that were similar to or larger than those on the ungrazed control, and markedly larger than those on the more heavily grazed pens. Additionally, field votes in the intermediate grazing intensity had more foetuses. Though a number of parameters may contribute to the observed patterns, we suggest that these primarily are caused by the livestock removing vegetation cover, thereby influencing the number and size of patches with high, dense vegetation in the vicinity of grass that is rejuvenated by grazing.

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619. Effects of grazing management treatment on grassland plant communities and prairie grouse habitat.

Manske, L. L.; Barker, W. T.; and Biondini, M. E.

In: *Prairie chickens on the Sheyenne National Grasslands*. (Held 18 Sep 1987 at Crookston, Minn.)

Bjugstad, Ardell J. (eds.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, US Department of Agriculture, Forest Service; 58-72; 1988.

Notes: Paper presented at a "Symposium on Prairie Chickens on the Shyenne National Grasslands," September 18, 1987, Crookston, Minnesota. Includes references.

NAL Call #: aSD11.A42

Descriptors: birds/ wildlife/ grasslands/ range management/ grazing/ North Dakota
This citation is from AGRICOLA.

620. Effects of grazing on long-billed curlew (*Numenius americanus*) breeding behavior and ecology in southwestern Idaho.

Bicak, T. K.; Redmond, R. L.; and Jenni, D. A.
In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 74-85; 1982.
NAL Call #: SF84.84.W5 1981

621. Effects of grazing on nesting by upland sandpipers in southcentral North Dakota.

Bowen, Bonnie S. and Kruse, Arnold D.
Journal of Wildlife Management 57(2): 291-301. (1993)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: endangered species/ field method/ marshland management/ protection
Abstract: Grazing by livestock is often used to reduce litter, improve plant vigor, and alter plant species composition, but additional information is needed on the effects of these management practices on upland-nesting birds. Thus, we conducted an experimental study of the effect of grazing on nest density and nest success of upland sandpipers (*Bartramia longicauda*) in southcentral North Dakota from 1981 to 1987. Our experimental design consisted of 4 treatments and 1 control, each applied to 1 field in each of 3 study areas. The treatments represented options available to grassland managers: spring grazing, autumn grazing, autumn-and-spring grazing, season-long grazing, and control (ungrazed during the study). Nests (n = 342) were found by searching study areas with a cable-chain drag. Nest density was lower (P = 0.006) for treatments where cattle were present (spring, autumn-and-spring, and season-long) than where cattle were not present (autumn and control) during the nesting season. We concluded that grazing during the nesting season reduced the nest density of upland sandpipers. Nest success varied among years (P = 0.01) and was low in the first year of grazing and higher at the end of the study period. We found little evidence that the grazing treatment influenced nest success. We recommend that public lands with breeding populations of upland sandpipers include a complex of fields under various management practices, including fields undisturbed during the nesting season.
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622. Effects of grazing on the demography and growth of the Texas tortoise.

Kazmaier, Richard T.; Hellgren, Eric C.; Ruthven, Donald C.; and Synatzske, David R.
Conservation Biology 15(4): 1091-1101. (2001)
NAL Call #: QH75.A1C5; ISSN: 0888-8892
Descriptors: demography/ disturbance tolerance/ grazing effects/ growth/ species management
Abstract: Considerable effort has been exerted in attempts

to understand the complex ecological effects of grazing. North American tortoises, by virtue of their distribution, provide a good model taxon through which to study how grazing effects vary with grazing regime, habitat, and climate. We studied the Texas tortoise (*Gopherus berlandieri*), which is restricted primarily to privately owned rangelands of southern Texas and northeastern Mexico. Management of this species is hampered by a lack of information on the effects of common land-use practices. We evaluated the effects of moderate grazing by cattle (short-duration, winter-spring rotational grazing regime; 6-28 animal-unit days/ha/year) on this tortoise by comparing two grazed and two ungrazed sites in the Western Rio Grande Plains, Texas (U.S.A.), from April 1994 to October 1997. We made 132 captures of 106 individuals in the ungrazed pastures and 324 captures of 237 individuals in the grazed pastures. We also radiotracked 22 tortoises in the ungrazed pastures and 25 tortoises in the grazed pastures. Comparisons of relative abundance, body-size distribution, age distribution, body mass, sex ratio, adult survival, proportion of juveniles, and growth rates revealed no differences (p>0.05 for all parameters) between tortoises on grazed and ungrazed areas. Based on these results, we suggest that moderate grazing by cattle is not incompatible with maintenance of Texas tortoise populations. Our data were consistent with a general model of tortoise biogeography and tolerance of disturbance which suggests that Texas tortoises are tolerant to intermediate levels of disturbance. Generalities about the effect of cattle grazing on the four North American tortoises should be avoided unless they can be placed in the context of grazing regime, precipitation, habitat quality, and tortoise requirements.
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623. Effects of grazing practices and fossorial rodents on a winter avian community in Chihuahua, Mexico.

Desmond, M.
Biological Conservation 116(2): 235-242. (2004)
NAL Call #: S900.B5; ISSN: 0006-3207
Descriptors: deserts/ grasslands/ grazing/ land use/ natural grasslands/ population density/ species diversity/ wild birds/ winter/ *Dipodomys spectabilis*
Abstract: Chihuahuan Desert grasslands are important wintering grounds for grassland and shrub-adapted birds. Many species belonging to these assemblages are currently exhibiting population declines. One area recognized for its importance to biological diversity, including grassland birds, is the Janos-Nuevo Casas Grandes black-tailed prairie dog (*Cynomys ludovicianus*) complex in northwestern Chihuahua, Mexico, an area containing 58 colonies with 30,000 ha of prairie dogs. This is one of the largest remaining prairie dog complexes and the only intact complex in the Chihuahuan Desert. In its current condition, a large percentage of this complex is of reduced value to wildlife. Overgrazing on communal (ejido) lands has resulted in areas being comprised of annual grasses and forbs. The density of active prairie dog burrows and banner-tailed kangaroo rat (*Dipodomys spectabilis*) mounds as well as avian diversity and abundance were lower on ejido lands than an adjacent private ranchland with and without prairie dogs. Few avian species used overgrazed portions of the prairie dog colony. Community similarity among plot types was low due to different management practices and differences on and off

colony. To retain, and in many instances restore the biological diversity of this important region it is essential to work with local ejidos on grazing management.

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624. Effects of grazing systems on sharp-tailed grouse habitat.

Mattise, S. N.; Linder, R. L.; and Kobriger, G. D.
In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.)
Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 124-132; 1982.
NAL Call #: SF84.84.W5 1981

625. Effects of land management on nesting success of sandhill cranes in Oregon.

Littlefield, C. D. and Paullin, D. G.
Wildlife Society Bulletin 18(1): 63-65. (1990)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: *Grus canadensis tabida*/ cattle grazing/
habitat/ refuge/ wetland
© The Thomson Corporation

626. Effects of land use on nongame wetland birds in western South Dakota stock ponds, U.S.A.

May, Shawn M.; Naugle, David E.; and Higgins, Kenneth F.
Waterbirds 25(Special Publication 2): 51-55. (2002)
NAL Call #: QL671; ISSN: 1524-4695
Descriptors: Landsat TM imagery data/ National Wetlands Inventory maps/ cattle grazing/ cropland landscapes/ grasslands/ habitat use/ land use change/ landscape types/ nesting habitat/ prairie landscapes/ stock ponds/ tillage agriculture/ vegetation cover/ wetlands
Abstract: Tillage agriculture is expanding into western prairie landscapes without knowledge of the effects of land use change on habitats used by nongame wetland birds. In 1999-2000, we surveyed 196 stock ponds within grassland (>95% grass) and cropland (>75% tillage) landscapes to evaluate effects of land use on nongame wetland bird densities in western South Dakota. Land use and wetlands were delineated from Landsat TM imagery and National Wetlands Inventory maps. Sixteen nongame wetland bird species used stock ponds in western South Dakota, of which nine species were obligate wetland-nesting species. Although densities of seven nongame obligate wetland bird species were similar between landscape types, abundance of Wilson's Phalarope (*Phalaropus tricolor*) was greater in grassland study areas where cattle grazing limited growth of thick-stemmed emergent vegetation and reduced overall vegetative cover in stock ponds. In contrast, the Red-winged Blackbird (*Agelaius phoeniceus*) and Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) were more abundant in cropland landscapes where stock ponds provide abundant over-water nesting habitat (e.g., cattail). If grasslands continue to be converted to cropland, Wilson's Phalarope numbers will likely decrease as blackbird densities increase in stock ponds dominated by monotypic stands of cattail. To circumvent such changes, we recommend that resource managers conserve large tracts of grassland through aggressive easement programs in landscapes at highest risk of agricultural tillage.
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627. The effects of large storm events on basin-range riparian stream habitats.

Platts, W. S.; Gebhardt, K. A.; and Jackson, W. L.
In: Riparian ecosystems and their management: Reconciling conflicting uses. (Held 16 Apr 1985-18 Apr 1985 at Tuscon, Ariz.) Johnson, R. Roy; Ziebell, Charles D.; Patton, David R.; Ffolliott, Peter F.; and Hamre, R. H. (eds.)
Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, United States, Forest Service; pp. 30-34; 1985.
NAL Call #: aSD11.A42
Descriptors: stream erosion/ storms/ riparian buffers/ grazing/ streams/ Nevada/ Utah
This citation is from AGRICOLA.

628. Effects of livestock grazing enclosure on aquatic macroinvertebrates in a montane stream New Mexico.

Rinne, J. N.
Great Basin Naturalist 48(2): 146-153. (1988)
NAL Call #: 410 G79; ISSN: 0017-3614
Descriptors: mammal/ biomass/ habitat/ watershed/ population density/ chi square
Abstract: Aquatic macroinvertebrate populations inhabiting reaches of a stream within areas excluded from livestock grazing for a decade were markedly different from those in grazed areas when density, biomass, biotic condition indices, and mean chi square indices of the two populations were compared. Increased densities and biomasses of more tolerant forms of macroinvertebrates were observed in grazed reaches. Because pretreatment data were not available, differences in macroinvertebrate populations and relative tolerances of taxa in grazed and ungrazed areas could be as easily attributed to linear changes in stream habitat as to removal of domestic livestock. Results of this study have implications for the design of futur research on the effects of livestock grazing on stream environments and biota: (1) baseline/pretreatment information is prerequisite, and (2) the study should take a watershed (ecosystem) approach.
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629. Effects of livestock grazing on benthic invertebrates from a native grassland ecosystem.

Scrimgeour, Garry J. and Kendall, Sharon
Freshwater Biology 48(2): 347-362. (2003)
NAL Call #: QH96.F6; ISSN: 0046-5070
Descriptors: biomass/ cattle grazing/ community structure/ livestock grazing/ native grassland ecosystem/ pH/ riparian vegetation/ riparian zones/ rotational grazing/ stream bank stability/ stream channel/ turbidity
Abstract: 1. The effects of cattle grazing on stream bank stability, biomass of riparian vegetation, instream vegetation cover, biomass of coarse particulate organic matter (CPOM) and epilithon and benthic invertebrate community structure were investigated over a 2-year period using: (i) enclosures containing different cattle grazing treatments and (ii) by comparing streams with different grazing intensities in the Cypress Hills Provincial Park, Alberta, Canada. 2. Livestock enclosure experiments comprised four treatments of: (1) early season cattle grazing (June-August), (2) late season cattle grazing (August-September), (3) all season cattle grazing (June-September) and (4) cattle-absent controls. All four treatments were replicated in two streams while two

treatments (i.e. cattle-absent controls, early season cattle grazing) were established in a third stream. 3. Bank stability, estimated visually based on sediment inputs to the stream channel, increased significantly in cattle-absent treatments compared with cattle-present enclosures over the 2-year study period. 4. Epilithic chlorophyll a was significantly affected by time, but neither cattle nor the interaction of time and treatment were significant. 5. At the end of the experiment, total invertebrate biomass in the late and all-season treatment exceeded that in the early and cattle-absent treatments. However, excluding cattle from the streams, at any of the different treatments, had little clear impact on the total benthic invertebrate abundance or the abundance of the predominant functional feeding groups over the 2-year study period. 6. In contrast, comparisons of benthic assemblages from streams with different grazing intensities showed that the non-grazed reach of Storm Creek contained significantly higher biomass of CPOM and shredders compared with the cattle-absent enclosures in Battle, Graburn and Nine Mile creeks. Redundancy analysis showed that benthic communities from all enclosures and Storm Creek in summer and autumn 2000 were affected primarily by CPOM biomass, pH, nitrate, turbidity and benthic chlorophyll a. Construction of a 99% probability ellipse from enclosure sites showed that invertebrate communities from livestock enclosures differed from that in the non-grazed Storm Creek. 7. Results from stream-scale comparisons indicate that current livestock grazing practices in the Cypress Hills significantly impact riparian zones, stream channels and benthic invertebrate community structure and that alternative practices, such as rotational grazing, need to be developed.

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630. Effects of livestock grazing on bird abundance and vegetation structure in shortgrass prairie.

Reinking, Dan L.; Wolfe, Donald H.; and Wiedenfeld, David A.

Oklahoma Ornithological Society Bulletin 33(4): 29-36. (2000); ISSN: 0474-0750

Descriptors: agricultural practices/ birds/ communities/ ecosystems/ grazing/ habitat alterations/ prairies/ wildlife/ livestock relationships/ horned lark/ western meadowlark/ grasshopper sparrow/ mourning dove/ common nighthawk/ killdeer/ Aves/ North America/ United States/ Texas/ Rita Blanca Natl. Grasslands

Abstract: The authors studied the present avian community composition in a shortgrass prairie ecosystem and determined the effects of differing grazing regimes on this composition. Six species of birds were recorded in the study area. Horned larks and western meadowlarks made up 49% and 40% of the birds observed, respectively.

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631. Effects of livestock grazing on mearns quail in southeastern Arizona.

Brown, R. L.

Journal of Range Management 35(6): 727-732. (1982)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1982/356/13brow.pdf>

Descriptors: *Cyrtonyx montezumae mearnsi*/ census-survey methods/ changes detrimental to wildlife/ cover/ food supply/ grassland/ grazing/ habitat/ livestock/ nests and nesting/ population density/ quail, Mearns harlequin/

wildlife-livestock relationships/ woodland climax/ North America/ United States/ Arizona/ Santa Cruz County/ Southeastern District

Abstract: The mechanics of the relationship between livestock grazing and quail densities are determined and estimates of the level of grazing intensity that is limiting to local quail populations are presented. Effects of cover removal on Mearns quail populations are examined: quail food supply was not reduced, but the elimination of escape cover and nesting grass was detrimental, especially to breeding populations.

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632. Effects of livestock grazing on neotropical migratory landbirds in western North America.

Bock, C. E.; Sabb, V. A.; Rich, T. D.; and Dobkin, D. S.

In: Status and management of neotropical migratory birds. (Held 21 Sep 1992-25 Sep 1992 at Estes Park, Colorado.) Finch, D. M. and Stangel, P. W. (eds.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, U.S. Dept. of Agriculture; pp. 263-309; 1993.

NAL Call #: aSD11.A42

Descriptors: Conservation Reserve Program/ regional conservation programs

Abstract: Examined the idea that moderate haying/grazing of CRP coupled with livestock enclosures on public land could enhance the value of public rangelands for wildlife.

633. Effects of livestock grazing on rangeland grasshopper (Orthoptera: Acrididae) abundance.

O'Neill, Kevin M.; Olson, Bret E.; Rolston, Marni G.; Wallander, Roseann; Larson, Deanna P.; and Seibert, Catherine E.

Agriculture, Ecosystems & Environment 97(1-3): 51-64. (2003)

NAL Call #: S601 .A34; ISSN: 0167-8809

Descriptors: food availability/ grazing impacts/ grazing intensity/ grazing management/ habitat characteristics/ habitat quality/ heavily grazed areas/ livestock grazing/ microclimate alteration/ microhabitats/ plant cover impacts/ potential oviposition sites/ ungrazed pastures

Abstract: Livestock may impact habitat quality for grasshoppers by reducing food availability and by altering microclimate and potential oviposition sites. A 5-year study was conducted to create consistent grazing impacts on replicated plots and measure their effects on plant cover, microclimate, and grasshopper abundance. Cattle were used to produce two levels of grazing intensity that were compared to ungrazed controls. Differences in plant cover were greatest immediately after grazing each summer, grasshopper microhabitats tending to be shadier, cooler, less windy, and more humid in the ungrazed plots. The grasshopper assemblage included five of the worst pest grasshopper species in North America: *Ageneotettix deorum*, *Aulocara ellioti*, *Melanoplus sanguinipes*, *M. packardii*, and *Camnula pellucida*. Most species had greater abundance on ungrazed pastures, particularly during the 4-6 weeks after grazing each year. However, *A. ellioti* was often more abundant in heavily grazed areas early in the year when early instars were present and in late summer when adults were predominant. There was no strong evidence that the effect of grazing on grasshopper abundance increased over the 5-year study. At this time, all changes in grasshopper numbers cannot be directly

attributed to particular habitat characteristics that changed after grazing, but the results suggest that grazing management could be used to reduce pest grasshopper densities.

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634. Effects of livestock grazing on small mammals at a desert cienaga.

Hayward, Bruce; Heske, Edward J.; and Painter, Charles W.

Journal of Wildlife Management 61(1): 123-129. (1997)
NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: conservation/ desert cienaga/ livestock grazing/ population abundance/ resource base/ small/ trophic level interaction

Abstract: Livestock in arid regions often concentrate their grazing in riparian areas, and this activity can have strong effects on native vegetation and wildlife. Small mammals at a desert wetland (cienaga) in southwestern New Mexico were more abundant on 2 1-ha plots from which livestock were excluded over a 10-year period than on 2 similar grazed plots ($P = 0.025$). However, species of small mammals differed in the direction and degree of their responses to livestock exclusion. Differences in mean abundance between grazed versus ungrazed plots could not be demonstrated for any species of small mammal individually because of strong annual variation in abundance and low statistical power of tests. However, the cumulative effect was that small mammals were 50% more abundant on plots from which livestock were excluded. Because small mammals provide an important resource base for many animals at higher trophic levels, even a few livestock exclosures of moderate size could benefit a variety of species of wildlife in desert wetlands.

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635. Effects of livestock grazing on the invertebrate prey base and on the survival and growth of larvae of the Columbia spotted frog, *Rana luteiventris*.

Howard, Amy and Munger, James C., 2003. 28 p. Idaho Bureau of Land Management Technical Bulletin.

http://www.id.blm.gov/techbulbs/03_07/SPOTTED%20FROG%20REPORT.pdf

Descriptors: animals and man/ disturbance by man/ commercial activities/ nutrition/ diet/ life cycle and development/ development/ ecology/ population dynamics/ predators/ habitat/ freshwater habitat/ lentic water/ lotic water/ land zones/ Nearctic Region/ USA/ North America/ Invertebrata: biomass/ community structure/ amphibian predators/ *Rana luteiventris*/ livestock grazing effects on prey base/ streams and ponds/ pond/ stream/ biomass and community structure/ livestock grazing effects/ significance for amphibian predator/ Idaho/ Owyhee Mountains/ livestock grazing effects on amphibian predator prey base/ ponds and streams/ Ranidae/ Anura/ Lissamphibia/ Amphibia/ amphibians/ chordates/ invertebrates/ vertebrates

Abstract: This report discusses results primarily from the second of two field seasons in which two aspects of grazing were examined for possible effects on Columbia spotted frogs (*Rana luteiventris*). First, exclosures were used to prevent grazing on portions of the streams and ponds to ascertain the effects of grazing on the invertebrate prey base utilized by the frogs. Although we found no statistically significant effect of grazing on either biomass or diversity of

invertebrate prey, care must be taken in the interpretation of these results. While it is possible that there was no effect of the specific grazing regimes of these sites on the invertebrate community, the small sample size, the very general taxonomic identification used, and weaknesses in study design may have masked any true differences. Adult spotted frogs were apparently not actively feeding during late August to late September. Metamorphs and subadults, however, would need to forage at that time to accumulate necessary fat reserves and would therefore be affected by changes in the invertebrate community. Further work is needed to more solidly document the effects of grazing on invertebrates. Second, spotted frog larvae were raised in microcosms located at the Mudflat Guard Station and were subjected to four levels of cattle waste. During the first year, survival of larvae was very low and growth was stunted, indicating that the experimental design needed modification for the second year's experiment. During the second year, we found that addition of waste negatively affected survival rate. We also found that cattle waste does not appear to be directly toxic, nor does the decreased survival seem to be due to decreased dissolved oxygen levels. The cause of decreased survival is probably an indirect effect of addition of waste, such as an increased ammonia concentration. We also found that addition of waste led to an increased growth rate of larvae. Further study is needed to determine whether, in the more natural conditions of the field, cattle waste affects survival and growth in the same way as was observed in the microcosms.

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636. The effects of livestock on California ground squirrels (*Spermophilus beecheyii*).

Fehmi, J. S.; Russo, S. E.; and Bartolome, J. W.

Rangeland Ecology and Management 58(4): 352-359. (2005)

NAL Call #: SF85 .J67; ISSN: 1550-7424

Descriptors: burrow patterns/ California grasslands/ cattle grazing/ oak savanna

Abstract: Understanding the impacts of livestock grazing on wildlands is important for making appropriate ecosystem management decisions. Using livestock exclosures, we examined the effects of moderate cattle grazing on the abundance of California ground squirrels (*Spermophilus beecheyii* Richardson) and the spatial distribution of active burrows within their colonies in grassland and blue oak (*Quercus douglasii* Hook. & Arn.) savanna habitats in the coastal range of California over a 3-year period (1991-1994). Overall, relative population densities of California ground squirrels declined significantly throughout the experiment, but did not differ between grazed and ungrazed colonies or between habitats. There was also no significant interaction between these 2 factors. The spatial distribution of burrows, as measured by the mean nearest neighbor distance of active entrances within a colony, did not differ significantly between grazed and ungrazed colonies or between habitats, nor was the interaction significant. Thus, low to moderate levels of cattle grazing did not appear to have a strong effect on the population dynamics of California ground squirrels, and grazing may be compatible with maintenance of ground squirrel populations. Based on multivariate analysis of variance of 1994 data, live plant cover, native plant cover, and standing biomass were lower where the number of burrows was higher on grazed colonies but were little affected on ungrazed colonies.

Ground squirrels may increase the impact of livestock grazing and thus reduce the capacity of the land to support other activities. However, it is clear that the effects of livestock grazing are complex and that detailed studies of potential mechanisms by which grazing impacts California ground squirrel populations are necessary.

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637. Effects of livestock removal and perennial grass recovery on the lizards of a desertified arid grassland.

Castellano, M. J. and Valone, T. J.

Journal of Arid Environments 66(1): 87-95. (2006)

NAL Call #: QH541.5.D4J6; ISSN: 0140-1963

Descriptors: desertification/ livestock grazing/ shrub encroachment/ tail autotomy

Abstract: We sampled lizards inside and outside of a 9.3 ha livestock enclosure in a desertified arid grassland in southeastern Arizona with pitfall traps and mark-recapture. Lizard community composition was significantly different inside versus outside of the enclosure. Analysis of tail-break frequencies suggests that higher predation rates outside the enclosure may contribute to increased abundance of *Sceloporus undulatus* and *Uta stansburiana* following livestock removal and associated changes in grass cover and vegetation complexity. In contrast, *Phrynosoma moudonensis* was significantly less abundant inside the enclosure. These results indicate that lizard abundance can increase and community composition can change in desertified arid grasslands following livestock removal that results in increased grass cover and vegetation complexity.
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638. Effects of protective fencing on birds, lizards, and black-tailed hares in the western Mojave Desert.

Brooks, M.

Environmental Management 23(3): 387-400. (1999)

NAL Call #: HC79.E5E5; ISSN: 0364-152X

Descriptors: grasslands/ deserts/ plant communities/ prey/ seeds/ species diversity/ nature reserves/ fencing/ ground cover/ wild birds/ wild animals/ grazing/ range management/ revegetation/ *Hymenoclea salsola*/ *Achnatherum spinosa*/ *Achnatherum hymenoides*/ grazing behaviour/ *Hymenoclea*/ *Achnatherum*

Abstract: Effects of protective fencing on wild birds, lizards, black-tailed hares (*Lepus californicus*), perennial plant cover, and structural diversity of perennial plants were evaluated during spring 1994 to winter 1995 at the Desert Tortoise Research Natural Area (DTNA), in the Mojave Desert, California, USA. At the northern study site the plant cover consisted of *Larrea tridentata*, *Ambrosia dumosa*, *Hymenoclea salsola*, *Achnatherum spinosa* and *A. hymenoides* and at the southern study site of *Atriplex polycarpa* and *H. salsola*. Abundance and species richness of birds were higher inside than outside the DTNA, and effects were larger during the breeding than during the wintering seasons and during a high rainfall than during a low rainfall year. Ash-throated flycatchers (*Myiarchus cinerascens*), cactus wrens (*Campylorhynchus brunneicapillus*), LeConte's thrashers (*Toxostoma lecontei*), loggerhead shrikes (*Lanius ludovicianus*), sage sparrows (*Amphispiza belli*), and verdins (*Auriparus flaviceps*) were more abundant inside than outside the DTNA. Nesting activity was also more frequent inside. Total abundance and species richness of lizards and individual abundances of western whiptail lizards (*Cnemidophorus tigris*) and

desert spiny lizards (*Sceloporus magister*) were higher inside than outside. In contrast, abundance of black-tailed hares was lower inside. Structural diversity of the perennial plant community did not differ due to protection, but ground cover was 50% higher in protected areas. Black-tailed hares generally preferred areas of low perennial plant cover, which may explain why they were more abundant outside than inside the DTNA. Habitat structure may not affect bird and lizard communities as much as availability of food at this desert site, and the greater abundance and species richness of vertebrates inside than outside the DTNA may correlate with abundances of seeds and invertebrate prey.

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639. Effects of rangeland fires and livestock grazing on habitat for nongame wildlife.

Ivey, G. L.

In: Proceedings of a symposium on sustaining rangeland ecosystems. (Held 29 Aug 1994-31 Aug 1994 at Eastern Oregon State College, La Grande, Oregon.) Edge, W. D. and Olsen-Edge, S. L. (eds.); Vol. Special Report 953. Corvallis, Ore.: Oregon State University Extension Service; pp. 130-139; 1996.

NAL Call #: 100 Or3M no.953

Descriptors: regrowth/ seed output/ wild birds/ wild animals/ vegetation/ ground cover/ range management/ grassland management/ endangered species/ grasslands/ rangelands/ nature conservation/ grazing/ burning/ plant succession/ species diversity

Abstract: Non-game wildlife (including wild birds and rodents) has a wide variety of requirements that may be influenced by burning or livestock grazing. These practices generally reduce ground cover and cause retrogression to an earlier seral stage, consequently favouring species that prefer short cover or bare areas and disadvantaging species requiring ground cover or vegetation structure. Degradation of riparian zones by burning or grazing generally reduced species diversity and populations. Species dependent on ungrazed habitat may be at risk of local extinction as a result of grazing in some areas. Using management techniques to provide a mosaic of habitats is recommended to preserve species diversity. Some non-game wildlife benefited from fire because of an increase in the growth of herbaceous and seed-producing plants.

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640. The effects of rest-rotation grazing of mule deer and elk populations inhabiting the Herd Creek Allotment, East Fork Salmon River, Idaho.

Yeo, Jeffrey J. University of Idaho, 1981.

Descriptors: *Cervus elaphus*/ *Odocoileus hemionus*/ behavior/ grazing/ fires/ burns/ habitat alterations/ interspecies relationships/ land use/ mammals/ wildlife/ livestock relationships/ North America/ United States/ Idaho

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641. The effects of rest-rotation grazing on the distribution of sharp-tailed grouse.

Nielsen, L. S. and Yde, C. A.
In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 147-165; 1982.
NAL Call #: SF84.84.W5 1981

642. Effects of rest, season-long, and delayed grazing of wetlands and adjacent uplands on cattle and waterfowl use.

Ruyle, G. B. University of California, Berkeley, 1980.
Descriptors: habitat management/ grazing/ thesis
© NISC

643. Effects of short-duration and continuous grazing on bobwhite and wild turkey nesting.

Bareiss, L. J.; Schulz, P.; and Guthery, F. S.
Journal of Range Management 39(3): 259-260. (1986)
NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1986/393/17bare.pdf>
Descriptors: turkeys/ nests/ nesting/ grazing/ livestock/ pastures/ Texas
This citation is from AGRICOLA.

644. Effects of short duration grazing on bobwhites and wild turkeys in south Texas.

Schulz, P. A. Texas A&M University, 1986.
Descriptors: *Colinus virginianus*/ *Meleagris gallopavo intermedia*/ livestock/ habitat disturbance/ land use/ Texas
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645. Effects of short duration grazing on deer home ranges.

Kohl, Timothy F.; DeYoung, Charles A.; and Garza, Andres
Proceedings of the Annual Conference: Southeastern Association of Fish and Wildlife Agencies 41: 299-302. (1987)
NAL Call #: SK1.S6; ISSN: 0276-7929
Descriptors: animals and man/ disturbance by man/ commercial activities/ reproduction/ sex differences/ behaviour/ land and freshwater zones/ Nearctic Region/ North America/ USA/ *Odocoileus virginianus* (Cervidae): farming and agriculture/ short term and continuous cattle grazing/ home range size relationships/ behavioural sex differences/ home range/ size/ short term and continuous cattle grazing effect/ Texas/ Brooks County/ King Ranch/ home range size/ sex differences/ short term and continuous cattle grazing effects/ Cervidae/ Artiodactyla/ Mammalia/ chordates/ mammals/ vertebrates
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646. Effects of short duration grazing on wild turkey home ranges.

Schulz, P. A. and Guthery, F. S.
Wildlife Society Bulletin 15(2): 239-241. (1987)
NAL Call #: SK357.A1W5; ISSN: 0091-7648
Descriptors: *Meleagris gallopavo intermedia*/ grazing management/ rangeland management/ habitat quality/ Texas/ USA
© The Thomson Corporation

647. Effects of specialized grazing systems on waterfowl production in southcentral North Dakota.

Barker, W. T.; Sedivec, K. K.; Messmer, T. A.; Higgins, K. F.; and Hertel, D. R.
In: Transactions of the North American Wildlife and Natural Resources Conference. (Held 16 Mar 1990-21 Mar 1990 at Denver, CO (USA).) McCabe, R. E. (eds.); Vol. 55.; pp. 462-474; 1990.

Notes: ISSN 0078-1355

NAL Call #: 412.9 N814

Descriptors: aquatic birds/ population dynamics/ agriculture/ grazing/ USA, North Dakota/ ducks/ livestock
Abstract: The recent decline in numbers of several waterfowl species and poor nesting success indicates that there is insufficient production of ducks in the prairie pothole region to maintain populations at desirable levels. About 50 percent of the ducks in North America are produced in the prairie pothole region and about 95 percent of the production occurs on private lands. Thus, a major effort to reverse the decline in duck numbers should emphasize the use of new and improved management techniques on private lands, particularly the use of new rangeland grazing systems. Numerous studies have evaluated the effects of grazing on duck production in North America. However, most of these evaluations were designed to compare differences of duck production between grazed lands and idle lands or among different land uses. Also, nearly all of the earlier studies of grazing effects involved seasonlong grazing treatments with occasional differences in grazing intensities. Seasonlong grazing has been shown to be detrimental to production of most upland nesting birds and also to maximum livestock production. A study of livestock and waterfowl relationships was initiated in 1982 on the Central Grasslands Research Center.
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648. Effects of summer sheep grazing on browse nutritive quality in autumn and winter.

Alpe, Michael J.; Kingery, James L.; and Mosley, Jeffrey C.
Journal of Wildlife Management 63(1): 346-354. (1999)
NAL Call #: 410 J827; ISSN: 0022-541X
Descriptors: acid detergent fiber/ acid detergent lignin/ browse nutritive quality/ neutral detergent fiber/ seasonality
Abstract: Prescribed livestock grazing in summer may improve the nutritive quality of autumn and winter browse for wild ungulates. We examined the effects of early-summer versus late-summer sheep grazing on autumn and winter browse quality in northern Idaho. Nutritive quality of 6 shrub species collected in September (autumn) and November (winter) was measured following early-summer (May-June) sheep grazing, late-summer (August) sheep grazing, and no grazing in 1993 and 1994. Shrub samples were analyzed for crude protein (CP), available protein, neutral detergent fiber (NDF), acid detergent fiber (ADF), and acid detergent lignin. Relative to the ungrazed control, early-summer sheep grazing improved both autumn and winter browse quality in redstem ceanothus (*Ceanothus sanguineus*), ninebark (*Physocarpus malvaceus*), rose (Rose spp.), and snowberry (*Symphoricarpos* spp.). Early-summer sheep grazing improved browse quality of thimbleberry (*Rubus parviflorus*) in autumn but had no effect on its nutritive quality in winter. In contrast, late-summer sheep grazing reduced both autumn and winter browse quality in redstem ceanothus and ninebark. Late-

summer grazing reduced autumn browse quality in snowberry and rose but improved browse quality of rose in winter. Scouler willow (*Salix scouleriana*) was not readily selected by sheep in either grazing season, which explains why the nutritive quality of Scouler willow in autumn and winter was unaffected by the grazing treatments. For most browse species, fiber content in autumn and winter was higher in 1993 than 1994, due to weather conditions. We conclude that prescribed sheep grazing can either improve or reduce autumn and winter browse nutritive quality for wild ungulates, depending upon weather conditions and the intensity of sheep browsing. For transitory ranges of the Inland Northwest, we suggest browse quality will likely improve if moderate sheep grazing (40-55% relative utilization) in summer ceases by mid- to late June. Autumn and winter browse quality should be largely unaffected if moderate sheep grazing in summer ceases by mid-August. Browse quality in autumn will probably be lowered if sheep grazing occurs in late August, but moderate sheep grazing in late August will have relatively minor effects on browse quality in winter.

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649. The effects of varied grazing management on epigeal spiders, harvestmen and pseudoscorpions of *Nardus stricta* grassland in upland Scotland.

Dennis, Peter; Young, Mark R.; and Bentley, Christopher
Agriculture, Ecosystems & Environment 86(1): 39-57. (2001)

NAL Call #: S601 .A34; ISSN: 0167-8809

Descriptors: grassland/ micro habitat/ plant litter/ species composition/ species diversity/ species dominance/ spider web count/ varied grazing management/ vegetation structure

Abstract: A hypothesis that epigeal arachnid assemblages benefit more from greater vegetation structure than botanical species composition in upland grasslands was tested. The test was carried out within a grazing experiment, initiated in 1991, to investigate vegetation dynamics in response to stocking with mixed livestock at varied rates. The experimental treatments comprised: no livestock, sheep only or sheep with cattle. Livestock treatments were grazed to maintain either 4.5 or 6.5 cm average sward heights between tussocks. Two replicates of each treatment were used and allocated to 10 plots across 22ha of *Nardus stricta*-dominated grassland. The effects on epigeal arachnids (excluding acarines) of the botanical and structural differences of the grassland between treatments during April-October 1993 and 1994 were assessed. Epigeal arachnid species composition was estimated using continuous pitfall trapping and the densities of mainly money spiders (Araneae: Linyphiidae) were estimated from monthly suction sampling and visual counts of spider webs in micro-habitats. These data were later compared with stocking rate, botanical species composition and vegetation structure. Forty of the 84 sampled species occurred in all experimental treatments. There was a significant effect of treatment on the number of arachnid species in suction but not in pitfall samples. There was also a significant effect of treatment on the relative abundance of 26% of these arachnid species. For most species of spider, harvestmen and pseudoscorpion, abundance was greater in the ungrazed and taller, grazed swards although a few species were captured in greater numbers in the treatments with shorter swards. Botanical composition, mean vegetation

height and grazing intensity accounted for 48.5-53.2% of the variability in the species composition/relative abundance of these arachnids, calculated by direct gradient analysis. Almost half of the species were randomly distributed across the experimental treatments and are recorded as widespread in upland heathland or grassland habitats and lowland grassland. More spider webs were counted during July-September 1993-1994, with greater numbers (dominated by the linyphiid species, *Lepthyphantes mengii*) counted in tall, ungrazed swards compared with taller grazed swards created by sheep alone or sheep with cattle. In the treatments with fewer webs, these were occupied by more linyphiid species. Suction sampling detected greater diversity of arachnids in the ungrazed *N. stricta*. This was related to increased plant litter below the leaf stratum where webs were counted. Vegetation structure and not botanical species composition within the *N. stricta* plant community determined arachnid species composition and abundance. Furthermore, no single grazing treatment supported the total number of arachnid species represented across the entire grazing experiment. It is concluded that varied grazing management, including some temporary ungrazed areas, is necessary to maintain the structural variability of grassland patches so as to maintain a spatial mosaic that favours the optimum arachnid fauna of upland grasslands.

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650. Elk (*Cervus elaphus nelsoni*) use of winter range as affected by cattle grazing fertilizing and burning in southeastern Washington.

Skovlin, J. M.; Edgerton, P. J.; and Mcconnell, B. R.
Journal of Range Management 36(2): 184-189. (1983)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1983/362/14skov.pdf>

Descriptors: bunch grass

Abstract: A study of ways to increase winter use by elk of Pacific bunchgrass foothill range in southeastern Washington employed fertilizing and rangeland burning, with and without spring cattle grazing. First-year response of elk to fertilizer applied in fall (56 kg N/ha) was a 49% increase in use; but no significant carry-over effect was noted in subsequent years. Fall burning to remove dead standing litter and enhance forage palatability provided no increase in elk use in winter. Intensive cattle grazing in spring to promote regrowth did not increase elk use. In fact, cattle grazing decreased winter elk use by 28% in 1 of the 3 yr studied. The cost effectiveness of increasing elk use by fertilizing appeared marginal except perhaps in special situations. A discussion of forage allocation to both elk and cattle is presented.

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651. Elk forage utilization within rested units of rest-rotation grazing systems.

Werner, Scott J. and Urness, Philip J.
Journal of Range Management 51(1): 14-18. (1998)

NAL Call #: 60.18 J82; ISSN: 0022-409X

http://jrm.library.arizona.edu/data/1998/511/014-018_werner.pdf

Descriptors: Cervus elaphus/ Cervus canadensis/ Bos taurus/ behavior/ foods/ feeding/ grazing/ habitat management/ mammals/ management/ wildlife/ wildlife/

livestock relationships/ wapiti/ cattle/ competition/
vegetation/ rest-rotation grazing/ elk/ North America/ United
States/ Utah: Fish Lake Natl. Forest

Abstract: Researchers determined elk forage utilization during the summers of 1994 and 1995 at the forest-grassland ecotone of three rest-rotation grazing allotments in Fishlake National Forest, Utah. klf.

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652. Elk use of winter range as affected by cattle grazing, fertilizing, and burning in southeastern Washington.

Skovlin, Jon M.; Edgerton, Paul J.; and McConnell, Burt R.
Journal of Range Management 36(2): 184-189. (1983)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1983/362/14skov.pdf>

Descriptors: Cervus elaphus nelsoni/ Cervus canadensis/
fertilization/ soil and water/ fires/ burns/ grazing/ habitat
alterations/ habitat use/ wildlife/ livestock relationships/
wapiti/ home-range/ winter/ agriculture/ habitat/
disturbance/ fire/ ecology/ ethology/ prairie/ fertilizer/ North
America/ United States/ Washington/ Washington,
southeastern/ USA

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653. Evaluating grazing strategies for cattle: Nutrition of cattle and deer.

Ortega, I. M.; Soltero-Gardea, S.; Drawe, D. L.; and
Bryant, F. C.

Journal of Range Management 50(6): 631-637. (1997)

NAL Call #: 60.18 J82; ISSN: 0022-409X

http://jrm.library.arizona.edu/data/1997/506/631-637_ortega.pdf

Descriptors: coastal bend of Texas/ continuous grazing/
crude protein/ digestibility/ IVDOM/ Odocoileus virginianus/
short-duration grazing

Abstract: We studied cattle and deer diet quality within replicated grazing treatments of continuous and short-duration grazing at heavy and moderate stocking rates. The study was conducted at the Welder Wildlife Refuge, Sinton, Tex. from October 1987 to July 1989. We obtained cattle diet samples from esophageally fistulated steers. Deer diets were reconstructed using data obtained through the bite-count technique. Digestibility (IVDOM) and crude protein (CP) of cattle diets were similar between grazing systems and stocking rates. Digestibility of deer diets was affected by both grazing systems and stocking rates. Dietary CP and IVDOM of deer and rattle diets both differed among seasons. Dietary CP levels met maintenance requirements for deer throughout the study. Also, CP levels were high enough to meet low- to mid-gestation requirements. Deer dietary protein requirements for growth and lactation were never met regardless of grazing strategy. Although protein content of cattle diets was relatively low, these values satisfied cattle maintenance needs. Nursing cows, however, would not have met their requirement in any season sampled regardless of grazing system or stocking rate. Continuous grazing and moderate stocking rates may provide white-tailed deer the opportunity for selecting diets containing more desirable forbs and greater nutrient concentration. Less intensive rotational grazing at moderate rates may be preferred to maintain a relatively high seral stage.

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654. Fall cattle grazing versus mowing to increase big-game forage.

Taylor, Nancy; Knight, James E.; and Short, Jeffrey J.

Wildlife Society Bulletin 32(2): 449-455. (2004)

NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: Blackfoot Clearwater Wildlife Management
Area/ nutrition/ seasons/ vegetation removal

Abstract: The effects of 3 levels of mowing and cattle (*Bos taurus*) grazing were examined on rough fescue (*Festuca scabrella*) range on the Blackfoot Clearwater Wildlife Management Area in west-central Montana. Treatments were implemented in enclosures during the fall of 1997 and 1998 at 50%, 70%, and 90% removal of herbaceous standing crop. Elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*) forage measurements were obtained in spring and summer on standing dead vegetation, green grass and forb biomass, total biomass, and percent live vegetation, and compared between mowing and prescribed cattle grazing at the same removal level. At the 50% mowing level, there was increased ($P<0.05$) availability of grass and biomass in the spring, with increased standing dead and decreased percent live vegetation in the summer. At the 70% mowing level, there was increased standing dead and grass and decreased percent live vegetation available to elk and mule deer in the spring when compared with the same level of grazing ($P<0.05$). At the 90% mowing level, there was decreased availability of grass and total biomass during spring and summer ($P<0.05$). Results indicated that at moderate (50%) levels of vegetation removal, fall mowing might be adequate to increase grass and total biomass availability in the spring, but fall grazing by cattle might remove more standing dead material, leaving more nutritious plants available to wildlife in the summer. Fall mowing at 70% removal might provide more grass for wildlife in the spring, but reduces percent live vegetation and leaves more standing dead when compared to fall cattle grazing. This would make it more difficult for wildlife to select preferred forage in the spring, when nutrition is needed for calf and fawn production. Fall cattle grazing might be a better tool to use at the 90% level, since mowing removes more grass and total biomass, leaving reduced vegetation for elk and mule deer.

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655. Fall grazing affects big game forage on rough fescue grasslands.

Short, J. J. and Knight, J. E.

Journal of Range Management 56(3): 213-217. (2003)

NAL Call #: 60.18 J82; ISSN: 0022-409X

Descriptors: cattle/ rotational grazing/ grazing intensity/
wildlife management/ Cervus elaphus/ Odocoileus/ range
management/ Festuca altaica/ biomass/ spring/ summer/
botanical composition/ forbs/ wildlife-livestock relations/
Montana

Abstract: Prescribed cattle grazing is often used to purposely enhance wildlife habitat. This study investigated the effects of fall cattle (*Bos taurus*) grazing intensity on elk (*Cervus elaphus*) and deer (*Odocoileus* spp.) forage in the following spring and summer. These effects were examined on rough fescue (*Festuca scabrella* Torr.) range on the Blackfoot Clearwater Wildlife Management Area in west central Montana. Cattle were grazed in enclosures during the fall of 1997 and 1998. A randomized complete block design with 5 replications of enclosures per year was used.

Grazing levels were 0% removal (control), 50% removal, 70% removal, and 90% removal of herbaceous standing crop. To evaluate elk and deer forage, measurements were obtained in spring and summer on green grass standing crop, green forb standing crop, percent green vegetation, species richness, and plant species composition. There were no differences among grazing levels for plant species composition based on canopy coverage, species richness, and green forb standing crop variables ($P > 0.10$). The 50% and 90% treatments reduced green standing crop in spring ($P = 0.07$) but not in summer ($P > 0.10$). Grazing treatments increased percent green vegetation ($P < 0.01$). Fall cattle grazing can be used as a wildlife habitat improvement tool to reduce unpalatable standing dead material. The 70% removal treatment was the most favorable for habitat improvement without degrading the range.

This citation is from AGRICOLA.

656. Fencing to control livestock grazing on riparian habitats along streams: Is it a viable alternative?

Platts, W. S. and Wagstaff, F. J.

North American Journal of Fisheries Management 4(3): 266-272. (1984)

NAL Call #: SH219.N66; ISSN: 0275-5947

Descriptors: habitat alterations/ management/ research--rivers and streams/ riparian habitat

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657. Fire and cattle grazing on wintering sparrows in Arizona grasslands.

Gordon, C. E.

Journal of Range Management 53(4): 384-389. (2000)

NAL Call #: 60.18 J82; ISSN: 0022-409X

http://jrm.library.arizona.edu/data/2000/534/384-389_gordon.pdf

Descriptors: wild birds/ beef cattle/ grazing/ prescribed burning/ grazing intensity/ wildlife management/ Arizona
 Abstract: This paper reports on the results of a 3-year field study of the effects of spring/summer burning and cattle grazing on wintering sparrows in the grasslands of southeastern Arizona. The effects of fire were studied with 1 year of pre-burn data and 1 year of post-burn data from 1 fire, plus limited sampling from a second fire at Buenos Aires National Wildlife Refuge in Pima County, Ariz. The effects of grazing were studied by comparing study plots at a site that has not been grazed by cattle since 1968 with a nearby grazed pasture in Santa Cruz County, Ariz. Sparrow abundance was measured as the number of captures from flush-netting sessions conducted by groups of 13-30 volunteers. Vesper (Poecetes gramineus (Gmelin)) and Savannah (Passerculus sandwichensis (Gmelin)) Sparrows responded positively to fire, while Cassin's Sparrows (Aimophila cassinii (Woodhouse)) responded negatively. The ecologically and geographically restricted Baird's (Ammodramus bairdii (Audubon)) and Grasshopper (A. savannarum (Gmelin)) Sparrows utilized burned areas during the first post-burn winter and did not significantly respond to fire. Both Ammodramus sparrows also utilized the grazed pasture; they were more abundant there than in the ungrazed study area in 1 year. While field observations and a prior study suggest that heavy grazing can have a

strong detrimental effect on Ammodramus sparrows, the results of this study suggest that moderate cattle grazing may be compatible with the conservation of these species. This citation is from AGRICOLA.

658. Food of vagrant shrews Sorex vagrans from Grant County, Oregon as related to livestock grazing pressures.

Whitaker, J. O.; Cross, S. P.; and Maser, C.

Northwest Science 57(2): 107-111. (1983)

NAL Call #: 470 N81; ISSN: 0029-344X

Descriptors: earthworm/ spider/ cricket/ caterpillar/ june bug/ moth/ slug/ snail/ trampling/ compression

Abstract: Major foods of the vagrant shrew (*S. vagrans*) in a relatively non-grazed portion of a mountain meadow in Grant County were earthworms, spiders, crickets, caterpillars, moths, slugs and snails and June beetles and their larvae. In 2 similar areas subjected to greater recent grazing, flightless forms (except caterpillars) were much less used; they were replaced primarily by caterpillars and flying insects. The hypothesized cause for these changes was that grazing trampled and compressed the ground, thus decreasing the populations of some forms.

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659. Foraging behavior by mule deer: The influence of cattle grazing.

Kie, J. G.; Evans, C. J.; Loft, E. R.; and Menke, J. W.

Journal of Wildlife Management 55(4): 665-674. (1991)

NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: Odocoileus hemionus/ reproductive energy demand/ activity pattern/ seasonality/ home range size/ wildlife management/ California/ USA

Abstract: We studied the effects of different cattle stocking rates on activity patterns of female mule deer (*Odocoileus hemionus*) on a summer range in the Sierra Nevada of California [USA]. Using an automated telemetry system, we determined that deer averaged 32 \pm 2.2 (SE)% of the time feeding, 8 \pm 1.1% traveling, and 60 \pm 2.4% resting per 24-hour period. Deer spent more time feeding and less time resting with increased cattle stocking rates. During 1984, a year of average precipitation, deer spent more time feeding per day in late summer than in early summer in range units grazed by cattle but did not do so in ungrazed range units. In 1985, a drier year, deer spent less time feeding per day in late summer in grazed range units. Time spent feeding by deer was negatively correlated with standing crop of herbaceous forage in meadow-riparian habitats. Deer increased their time spent feeding by shortening the length of resting bouts and including more feeding bouts each day, not by increasing the length of each foraging bout. Companion studies indicated that with cattle grazing, deer home-range sizes were larger (Loft 1988), and hiding cover for fawns was reduced (Loft et al. 1987). The results are consistent with the hypothesis that cattle competed with deer, particularly at high stocking rates and during a year of below-average precipitation. We suggest that female mule deer were acting as time-minimizers to meet the high energetic demands of lactation while minimizing their exposure to predators. Management options to reduce adverse effects include reducing or eliminating cattle grazing during early summer on all or part of the grazing allotment.

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660. Frog communities and wetland condition: Relationships with grazing by domestic livestock along an Australian floodplain river.

Jansen, A. and Healey, M.

Biological Conservation 109(2): 207-219. (2003)

NAL Call #: S900.B5; ISSN: 0006-3207

Descriptors: man-induced effects/ wetlands/ environmental factors/ plant populations/ community composition/ water quality/ agriculture/ river basin management/ flooding/ habitat/ nature conservation/ flood plains/ management/ conservation/ Anura/ Australia, Murrumbidgee R./ Australia/ livestock grazing intensity/ frogs/ toads

Abstract: Frogs are in decline worldwide, and are known to be sensitive indicators of environmental change.

Floodplains of the Murray-Darling Basin in southeastern Australia have been altered in many ways by livestock grazing, by the introduction of exotic fish, and by changes to flooding regimes. These changes have led to declines in wetland condition and hence to the availability of habitat for wetland frogs. This study examined relationships between frogs, wetland condition and livestock grazing intensity at 26 wetlands on the floodplain of the Murrumbidgee River. Frog communities, species richness, and some individual species of frogs declined with increased grazing intensity. Wetland condition also declined with increased grazing intensity, particularly the aquatic vegetation and water quality components. There were clear relationships between frog communities and wetland condition, with several taxa responding to aquatic and fringing vegetation components of wetland condition. Thus, grazing intensity appeared to influence frog communities through changes in wetland habitat quality, particularly the vegetation. Reduced stocking rates may result in improved wetland condition and more diverse frog communities. River management to provide natural seasonal inundation of floodplain wetlands may also enhance wetland condition, frog activity and reproductive success.

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661. Grasshopper densities on grazed and ungrazed rangeland under drought conditions in southern Idaho.

Fieldin, Dennis J. and Brusven, Marilyn A.

Great Basin Naturalist 55(4): 352-358. (1995)

NAL Call #: 410 G79; ISSN: 0017-3614

Descriptors: livestock grazing/ population density/ range management

Abstract: Low-density grasshopper populations were sampled at 15 pairs of rangeland sites in south central Idaho. One site of each pair had not been grazed by livestock for at least 10 years. Grazed sites were managed under normal grazing regimes established by the Bureau of Land Management. Mean grasshopper density was higher on ungrazed sites than on grazed sites. Proportions of *Melanoplus sanguinipes* were higher on ungrazed sites than on grazed sites and were higher on annual grasslands than on other vegetation types. Effects of grazing appeared to be independent of vegetation type. Proportions of Gomphocerinae, a subfamily of grasshoppers that feeds almost exclusively, on grasses, were affected by vegetation type, but not grazing. Crested wheatgrass seedlings supported the highest proportions of Gomphocerinae. Proportions of Oedipodinae were affected by grazing and vegetation type. Higher proportions of Oedipodinae were found on grazed sites than on ungrazed sites, and on sagebrush/grass sites than on annual grasslands. Results

indicate that livestock grazing during drought conditions tends to reduce grasshopper populations on southern Idaho rangeland.

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662. Grassland birds and habitat structure in Sandhills prairie managed using cattle or bison plus fire.

Griebel, Randall L.; Winter, Stephen L.; and Steuter, Allen A.

Great Plains Research 8(2): 255-268. (1998)

NAL Call #: QH104.5.G73 G755; ISSN: 1052-5165

Descriptors: Bison bison/ birds/ communities/ ecosystems/ fires/ burns/ grasslands/ grazing/ habitat alterations/ interspecies relationships/ mammals/ prairies/ bison/ Nebraska

Abstract: The authors provide information on bird abundance, distribution, and habitat structure from similar sandhill prairie landscapes managed traditionally with grazing by cattle and by a dynamic bison plus fire regime in the Great Plains. Specific habitat patches produced by fire and intensive bison grazing appear to have different bird communities and habitat structure at the local scale.

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663. Grassland management impacts on small mammals.

Adhikari, T. R.

In: Grassland ecology and management in protected areas of Nepal: Proceedings of a workshop. (Held 15 Mar 1999-19 Mar 1999 at Royal Bardia National Park, Thakurdwara, Bardia, Nepal.); Vol. Volume 2: Terai protected areas.; pp. 92-97; 2000.

NAL Call #: QH193.N4 G73 2000

Descriptors: grasslands/ environmental degradation/ cutting/ fires/ grazing/ nature reserves/ burning/ controlled burning/ grassland management/ wild animals/ small mammals/ wetlands/ floodplains/ nature conservation

Abstract: Grasslands cover more than 13% of the total area of Nepal. They have declined very rapidly in area, however, and are now mostly confined to protected areas. Nepal has established 15 protected areas, however, excessive grass cutting, fire, and grazing continues. Villagers are allowed into the protected areas to harvest thatch grasses and reeds for 10 days annually. In Royal Bardia National Park, 21 000, 45 000, and 57 000 people entered the park in 1983, 1993, and 1999, respectively, to harvest grass. Grazing is rampant in the protected areas. Both park staff and local people set fire to the Terai grasslands in winter burning 70-90% of the total area. This form of management, however, has been shown to have deleterious effects on disturbance-intolerant and cover-dependent small mammals.

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664. Grazing and passerine breeding birds in a Great Basin low-shrub desert.

Medin, D. E.

Great Basin Naturalist 46(3): 567-572. (1986)

NAL Call #: 410 G79; ISSN: 0017-3614

Descriptors: animals and man/ habitat modification/ ecology/ population dynamics/ habitat/ terrestrial habitat/ land and freshwater zones/ Nearctic Region/ North America/ USA/ Passeriformes: agricultural activity/ sheep grazing effects on breeding populations and community/ biomass/ community structure/ population density/ breeding

populations/ UT/ desert habitat/ low shrub/ breeding populations and community structure/ effects of sheep grazing/ Utah/ Millard County/ desert xperimental range/ breeding community structure and populations in relation to sheep grazing/ Passeriformes/ Aves/ birds/ chordates/ vertebrates

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665. Grazing effects on nutritional quality of bluebunch wheatgrass for elk.

Wambolt, Carl L.; Frisina, Michael R.; Douglass, Kristin S.; and Sherwood, Harrie W.

Journal of Range Management 50(5): 503-506. (1997)

NAL Call #: 60.18 J82; ISSN: 0022-409X

http://jrm.library.arizona.edu/data/1997/505/503-506_wambolt.pdf

Descriptors: Cervus elaphus nelsoni/ Cervus canadensis/ Bos taurus/ behavior/ ecosystem/ foods/ feeding/ grazing/ mammals/ nutrients/ overwintering/ rangeland/ wildlife/ habitat relationships/ wapiti/ cattle/ interspecies relations/ nutrition [physio./ biochem./] elk/ North America/ United States/ Montana

Abstract: The authors studied the nutrient content of bluebunch wheatgrass in a three-pasture rest-rotation grazing system and in an enclosure on the elk winter range in southwestern Montana. The wheatgrass was cattle-grazed in the spring, ungrazed by cattle for a year, or given a long-term rest. Nitrogen and phosphorus were greater in the spring-grazed pasture, but regrowth of wheatgrass in this plot did not improve the nutrient content for wildlife over the non-grazed plots. Elk were not likely to eat enough bluebunch wheatgrass to meet their protein maintenance requirements during winter. lgh.

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666. Grazing effects on stream habitat and fishes: Research design considerations.

Rinne, J. N.

North American Journal of Fisheries Management 8(2): 240-247. (1988)

NAL Call #: SH219.N66; ISSN: 0275-5947

Descriptors: grazing/ river banks/ erosion control/ vegetation cover/ habitat improvement (biological)/ fishery management/ research programs/ environmental impact/ environmental conditions/ population levels/ Salmonidae/ population levels/ USA, New Mexico, Vacas R./ vegetation cover/ habitat improvement (biological)

Abstract: A 4-year study of a montane stream from which cattle grazing had been excluded for 10 years indicated that stream bank vegetation and stability were markedly improved and that stream substrate fines were somewhat reduced, but it indicated that fish populations were unaffected. Shortcomings of this case history study are common to past similarly designed studies of grazing effects on fishes and their habitats. Three major deficiencies in research design are (1) lack of pretreatment data, (2) improper consideration of fishery management principles, and (3) linear positioning of treatments along a stream. Future research on riparian grazing effects must address these factors in addition to designs of long-term (10+ years) ecosystem (watershed) studies.

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667. Grazing impacts on soil mites of semi-arid chenopod shrublands in western Australia.

Kinnear, Adrienne and Tongway, David

Journal of Arid Environments 56(1): 63-82. (2004)

NAL Call #: QH541.5.D4J6; ISSN: 0140-1963

Descriptors: animals and man/ disturbance by man/ commercial activities/ ecology/ population dynamics/ habitat/ terrestrial habitat/ land zones/ Australasian Region/ Australasia/ Australia/ Acari: farming and agriculture/ sheep grazing/ community structure/ population density/ terrestrial habitat/ chenopod shrublands/ impact of sheep grazing on soil fauna/ soil habitat/ Western Australia/ Boolethana Station/ chenopod shrubland/ population densities and community structure/ impact of sheep grazing/ soil fauna/ Acari/ Arachnida/ arachnids/ arthropods/ chelicerates/ invertebrates

Abstract: This research describes the effects on the soil mite fauna of two sheep-grazing intensities applied to chenopod shrublands in both good and poor conditions. Soil was sampled from within and between bluebush (*Maireana polypterygia*) accretion mounds, 9 and 18 months following a 10-year grazing trial. There were major differences in the mite assemblages associated with the grazing treatments. Heavily grazed sites had reduced abundances of most mite species and substantially reduced diversity. In this ecosystem, soil accretion mounds below bluebush are important sites of acarine diversity and abundance. Of a total of 75 species, 49% were found only in this habitat. The decline of mite assemblages associated with vegetation degradation and mound decay mirrors declining soil properties, which have been described for these sites. These soils have particularly high species richness, with broad similarities in mite composition (at family and generic levels) with similar environments elsewhere in the world, continuing the trends found by other researchers.

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668. Grazing in the Sierra Nevada: Home range and space use patterns of mule deer as influenced by cattle.

Loft, Eric R.; Kie, John G.; and Menke, John W.

California Fish and Game 79(4): 145-166. (1993)

NAL Call #: 410 C12; ISSN: 0008-1078

Descriptors: Odocoileus hemionus/ Bos taurus/ behavior/ grazing/ habitat use/ mammals/ home range/ territory/ wildlife/ livestock relationships/ mule deer/ cattle/ home-range/ food/ competition/ cover/ dispersion/ habitat/ North America/ United States/ California: Sierra Nevada/ USA

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669. Grazing management impacts on quail during drought in the northern Rio Grande Plain, Texas.

Campbell Kissock, L.; Blankenship, L. H.; and White, L. D.

Journal of Range Management 37(5): 442-446. (1984)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1984/375/13kiss.pdf>

Descriptors: Colinus virginianus/ Callipepla squamata/ grass

Abstract: Relationships between the abundance of 2 quail species [Colinus virginianus, Callipepla squamata] and range site and grazing management during drought were evaluated in the northern Rio Grande Plain of Texas. Clay loam range sites provided better nesting cover and greater abundance of forbs for quail than sandy loam and shallow

ridge range sites. Foliar cover and aboveground standing crop of grass were greater on the 3 range sites within the short duration and deferred rotation systems as compared with the yearlong system. During drought, grazing systems provided better nesting and protective cover for quail than yearlong grazing.

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670. Grazing management in Texas and its impact on selected wildlife.

Bryant, F. C.; Guthery, F. S.; and Webb, W. M.
In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 94-112; 1982.

NAL Call #: SF84.84.W5 1981

Descriptors: Texas

This citation is from AGRICOLA.

671. Grazing management influences on two brook trout streams in Wyoming.

Hubert, W. A.; Lanka, R. P.; Wesche, T. A.; and Stabler, F.
In: Riparian ecosystems and their management: Reconciling conflicting uses. (Held 16 Apr 1985-18 Apr 1985 at Tuscon, Ariz.) Johnson, R. Roy; Ziebell, Charles D.; Patton, David R.; Ffolliott, Peter F.; and Hamre, R. H. (eds.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, United States, Forest Service; pp. 290-294; 1985.

NAL Call #: aSD11.A42

Descriptors: riparian environments/ grazing/ environment management/ environmental impact/ habitat/ abundance/ *Salvelinus fontinalis*/ USA, Wyoming/ cattle grazing
Abstract: Brook trout (*Salvelinus fontinalis*) abundance and instream habitat characteristics were evaluated in two rangeland streams. Heavily grazed and lightly grazed reaches of two streams with different grazing management were compared. Relationships between stream morphology, riparian zone characteristics, and trout abundance were observed.

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672. Grazing management strategies for Lahontan Cutthroat trout stream habitats.

Coffin, P. D.
In: Proceedings of a symposium on sustaining rangeland ecosystems. (Held 29 Aug 1994-31 Aug 1994 at Eastern Oregon State College, La Grande, Oregon.) Edge, W. D. and Olsen-Edge, S. L. (eds.); Vol. Special Report 953. Corvallis, Ore.: Oregon State University Extension Service; pp. 150-152; 1996.

NAL Call #: 100 Or3M no.953

Descriptors: grassland management/ grazing systems/ damage/ grasslands/ riparian grasslands/ grazing/ management/ plant height/ grazing intensity/ nature conservation/ soil conservation

Abstract: Recommended grazing management practices for the maintenance of the Lahontan cutthroat trout in Nevada, California and Oregon included maximum allowable use of 20% of the annual growth of woody species and 30% of the annual growth of other key riparian species; >6 inches grazing height left at the end of the season; limiting streambank damage to 10%; introducing

grazing rest periods preferably annually; limiting livestock access to the stream; and monitoring of hot season grazing use.

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673. Grazing pressure impacts on potential foraging competition between angora goats and white-tailed deer.

Ekblad, R. L.; Stuth, J. W.; and Owens, M. K.
Small Ruminant Research 11(3): 195-208. (1993)

NAL Call #: SF380.I52; ISSN: 0921-4488

Descriptors: *Capra hircus*/ *Odocoileus virginianus*/ grazing/ foods/ feeding/ habitat alterations/ habitat use/ wildlife/ livestock relationships/ white-tailed deer/ domestic goat/ experiment/ food/ North America/ United States/ Texas: Zavala County/ USA

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674. Grazing regime as a tool to assess positive side effects of livestock farming systems on wading birds.

Tichit, Muriel; Renault, Olivier; and Potter, Thomas
Livestock Production Science 96(1): 109-117. (2005)

NAL Call #: SF1.L5; ISSN: 0301-6226

Descriptors: wet grassland/ grazing regime/ livestock fanning system/ wader

Abstract: Wet grasslands support large populations of waders. As these birds are very sensitive to sward height and heterogeneity, grazing management is a key issue to their conservation. On a French coastal marsh consisting of 816 fields of wet grasslands, birds were monitored in spring and grazing regimes were assessed at three periods: year, spring, autumn. Each species was associated with a particular annual grazing index lower than the mean for all grazed fields. During spring, grazing intensity was significantly lower for fields occupied by birds than for those of the entire landscape. Different species of waders showed different preferences to grazing intensity with redshanks and curlews representing two extremes of a gradient going from low to high intensity. In early spring, the more precocious species selected fields with a significantly higher mean and variance in autumn stocking rate than for all grazed fields in previous autumn. These results highlight the need to maintain a variety of grazing regimes if conservation of the waders is to be achieved at the community level. On the basis of our analysis, useful indicators related to thresholds on livestock density and turn-out date can be derived to assess positive side effects of livestock fanning systems. (c) 2005 Elsevier B.V. All rights reserved.

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675. Grazing to improve wader habitat on alkaline meadows in eastern Austria.

Kohler, Bernhard and Rauer, Georg
Wader Study Group Bulletin 61(Suppl.): 82-85. (1991).
Notes: Place of Publication: Bournville, Birmingham, England

Descriptors: birds, shore/ *Tringa totanus*/ *Limosa limosa*/ breeding/ ecosystems/ grazing/ habitat alterations/ meadows/ wildlife/ livestock relationships/ wildlife/ habitat relationships/ habitat: description/ interactions with man: conservation measures/ redshank/ common redshank/ black-tailed godwit/ Europe/ Austria

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676. Guild structure of a riparian avifauna relative to seasonal cattle grazing.

Knopf, F. L.; Sedgwick, J. A.; and Cannon, R. W.

Journal of Wildlife Management 52(2): 280-290. (1988)

NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: Salix spp./ Dendroica petechia/ Passerculus sandwichensis/ Melospiza melodia/ Melospiza lincolni/ Empidonax traillii/ Zonotrichia leucophrys/ Turdus migratorius/ Agelaius phoeniceus/ Molothrus ater/ habitat/ generalist/ specialist/ population density/ community structure/ vegetation structure/ Arapaho National Wildlife Refuge/ Colorado, USA

Abstract: The avifauna within the willow (*Salix* spp.) community on the Arapaho National Wildlife Refuge [Colorado, USA] (NWR) was dominated (96% of all observations each year) by 11 species of passerine birds during the summers of 1980-81. Using 28 vegetation variables measured or calculated for randomly selected points and points where birds were sighted, we assigned the species to 3 distinct response guilds relative to historical patterns of seasonal grazing. A eurytopic response guild (habitat generalists) included yellow warblers (*Dendroica petechia*) (YEWA), savannah sparrows (*Passerculus sandwichensis*) (SASP), and song sparrows (*Melospiza melodia*) (SOSP). A stenotopic response guild (habitat specialists) included willow flycatchers (*Empidonax traillii*) (WIFL), Lincoln's sparrows (*Melospiza lincolni*) (LISP), and white-crowned sparrows (*Zonotrichia leucophrys*) (WCSP). The intermediate, mesotopic response guild included American robins (*Turdus migratorius*) (AMRO), red-winged blackbirds (*Agelaius phoeniceus*) (RWBL), and brown-headed cowbirds (*Molothrus ater*) (BHCO). Population densities of the eurytopic response guild differed little between healthy (historically winter-grazed) and decadent (historically summer-grazed) willow communities within a year. Densities of species in the mesotopic response guild differed more dramatically, and stenotopic response-guild species were absent or accidental in decadent willows. Information on habitat use patterns of the individual species between years supported the definition of response guilds; vegetation structure was most variable in habitats of eurytopic species and least variable in habitats of stenotopic species. Comparisons between used and available vegetation features indicated that species in the stenotopic response guild used locations that differed from random on the basis of bush spacing. We hypothesize that the response-guild structure primarily reflects the impact of cattle upon the horizontal patterning of the vegetative community.

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677. Habitat and avifaunal recovery from livestock grazing in a riparian meadow system of the northwestern Great Basin.

Dobkin, David S.; Rich, Adam C.; and Pyle, William H.

Conservation Biology 12(1): 209-221. (1998)

NAL Call #: QH75.A1C5; ISSN: 0888-8892

Descriptors: avifaunal composition/ avifaunal recovery/ habitat recovery/ livestock grazing/ riparian meadow system/ species abundance/ species richness

Abstract: Riparian habitats are centers of biological diversity in arid and semiarid portions of western North America, but despite widespread loss and degradation of these habitats there is little quantitative information

concerning restoration of native riparian biota. We examined the recovery of a riparian meadow system in the context of long-term versus short-term release from livestock grazing. We compared the structure and dynamics of plant and avian communities on 1.5-ha plots inside a long-term (>30 years) livestock enclosure ("enclosure plots"), with adjacent plots outside the enclosure ("open plots") for 4 years following removal of livestock from open plots. Throughout the study, sedge cover, forb cover, and foliage height diversity of herbs were greater on enclosure plots, bare ground, litter cover, shrub cover, and shrub foliage height diversity were greater on open plots. Forb, rush, and cryptogamic cover increased on open plots but not on enclosure plots. Grass cover increased, whereas litter and bare ground decreased on all plots in conjunction with increased availability of moisture. Sedge cover did not change. Avian species richness and relative abundances were greater on enclosure plots, species composition differed markedly between enclosure and open plots (Jaccard Coefficient = 0.23-0.46), with enclosure plots dominated by wetland and riparian birds and open plots dominated by upland species. The appearance of key species of wet-meadow birds on open plots in the third and fourth years following livestock removal signaled the beginning of restoration of the riparian avifauna. We interpret the recovery of riparian vegetation and avifaunal composition inside the enclosure as a consequence of livestock removal, which led to a rise in the water table and an expansion of the byporheic zone laterally from the stream channel. The lack of change in sedge and shrub cover on open plots suggests that restoration to a sedge-dominated meadow will not happen quickly.

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678. Habitat quality and management for the northern brown argus butterfly *Aricia artaxerxes* (Lepidoptera: Lycaenidae) in north east England.

Ellis, S.

Biological Conservation 113(2): 285-294. (2003)

NAL Call #: S900.B5; ISSN: 0006-3207

Descriptors: grazing management/ grazing pressure/ habitat management/ habitat quality/ population dynamics/ species abundance

Abstract: An experimental study at four North East England sites, was used to examine ovipositing preferences in the scarce northern brown argus butterfly *Aricia artaxerxes*. The impact of grazing management on habitat quality and adult population dynamics was examined using transect counts over a 10-year period at Thrislington Plantation NNR. The selection of ovipositing sites was not dependent upon the abundance of the hostplant, common rock-rose *Helianthemum nummularium*, or on the presence of bare ground. Eggs were frequently laid on the younger, second and third pair of leaves from the tip of the hostplant shoot and selected leaves were larger than leaves of randomly selected plants. In a laboratory experiment, hostplants treated with nitrogen, with larger and thicker leaves were selected for ovipositing most frequently. Fewer eggs were laid in managed (shorter vegetation) than unmanaged (taller vegetation) experimental plots and similarly, adults were much less abundant in grazing compartments subjected to higher grazing pressures, although recoveries were apparent once these were relaxed. *A. artaxerxes* is able to survive in a range of sward heights, but population densities were lowest in short vegetation (<5 cm) and

increased in medium (6-10 cm) to tall (>10 cm) swards. Grazing pressures less than about 0.2 Livestock Units appeared to be most beneficial. The implications of these results for the conservation *A. artaxerxes* sites are discussed.

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679. Habitat selection by the Texas tortoise in a managed thornscrub ecosystem.

Kazmaier, Richard T.; Hellgren, Eric C.; and Ruthven, Donald C.

Journal of Wildlife Management 65(4): 653-660. (2001)
NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: radiotelemetry: monitoring method/ Tamaulipan Biotic Province/ brush invasion [brush encroachment]/ canopy cover/ community ecology/ conservation biology/ grazing pastures/ habitat change/ habitat management/ habitat selection/ land use/ old field pastures/ riparian habitats/ semiarid shrublands: habitat/ thornscrub ecosystems/ vegetation types

Abstract: Brush encroachment on semiarid shrublands resulting from livestock grazing has created global concern. Southern Texas is dominated by *Prosopis-Acacia* mixed brush communities typical of the Tamaulipan Biotic Province, and the geographic range of the state-threatened Texas tortoise (*Gopherus berlandieri*) is nearly identical to the boundaries of this biotic province in Texas. In light of the perceived threat to Texas tortoises because of habitat change caused by brush encroachment, we monitored 36 Texas tortoises by radiotelemetry during 1994-1996 to assess habitat selection on a site containing grazed and ungrazed pastures. Tortoises did not exhibit habitat selection at the level of locations within home ranges. Differential habitat selection at the level of home ranges within study areas was not apparent for sex, but was evident for treatment (grazed or ungrazed). Analysis of pooled data indicated that tortoises exhibited broad-scale selection for home ranges within study areas. Selection was expressed as preferential avoidance of old-field and riparian habitats, which represented vegetational extremes of canopy cover. However, tortoises tolerated the broad continuum of other brush communities on the study site. Apparent treatment differences may be an artifact of our inability to adequately pair study areas given the scale of tortoise movement. Our data indicate that increases in the extent of woody canopy cover resulting from grazing-induced brush encroachment will not be detrimental to Texas tortoises. Furthermore, large-scale range improvement practices, such as root-plowing, create unsuitable habitats for this species.

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680. Habitat shifts by mule deer the influence of cattle grazing.

Loft, E. R.; Menke, J. W.; and Kie, J. G.

Journal of Wildlife Management 55(1): 16-26. (1991)
NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: *Odocoileus hemionus*/ *Populus tremuloides*/ riparian habitat/ competition

Abstract: We studied the effects of cattle on selection of home ranges and habitats by female mule deer (*Odocoileus hemionus*) on summer range in the Sierra Nevada, California. Three grazing levels (no grazing, moderate grazing, and heavy grazing) were imposed on 3 fenced range units over 3 years. Habitat selection by 13

radio-collared female mule deer was estimated each summer; habitat selection by radio-collared cattle was estimated at the 2 grazing levels. In the absence of grazing, meadow-riparian habitat comprised a greater proportion of deer home ranges than during grazing. During moderate and heavy grazing, a greater proportion of montane shrub habitat was included within deer home ranges than when ungrazed. Within home ranges, deer preferred meadow-riparian habitat at all grazing levels, whereas aspen (*Populus tremuloides*) habitat was preferred only during no grazing. Deer preference for meadow-riparian habitat declined over the summer, more so with cattle grazing. Cattle also preferred meadow-riparian and aspen habitat. The greatest effect of cattle on habitat selection by female mule deer occurred during late summer with heavy grazing when forage and cover were at a minimum in preferred habitats. Female mule deer shifted habitat use by reducing their use of habitats preferred by cattle and increasing their use of habitats avoided by cattle. These results were consistent with expectations of competition and habitat selection theory.

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681. Historical and present impacts of livestock grazing on fish and wildlife resources in Western riparian habitats.

Ohmart, Robert D.

In: *Rangeland wildlife*/ Krausman, Paul R.
Denver, Colo.: Society of Range Management, 1996;
pp. 245-279

NAL Call #: SK361.R36 1996

Descriptors: animals and man/ disturbance by man/ commercial activities/ documentation/ publications/ habitat/ terrestrial habitat/ land and freshwater zones/ comprehensive zoology: farming and agriculture/ literature review/ riparian habitat/ livestock grazing/ biological effects/ N. America/ Nearctic Region/ North America/ west/ biological effects of livestock grazing/ past and present/ review/ riparian habitats

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682. Impact of cattle grazing on prostigmatid mite densities in grassland soils of southern interior British Columbia.

Battigelli, J. P.; McIntyre, G. S.; Broersma, K.; and Krzic, M.
Canadian Journal of Soil Science 83(5): 533-535. (2003)

NAL Call #: 56.8 C162; ISSN: 0008-4271

Descriptors: cattle grazing/ cattle grazing impacts/ grassland ecosystems/ grassland soils/ range management/ sample depth/ sampling season/ soil mesofauna: soil ecosystem component

Abstract: Soil mesofauna are an important part of soil ecosystems, but little is known about them in grassland ecosystems of southern interior British Columbia. In this study, 12 300 organisms were examined and prostigmatid mites were most abundant, representing 95% of the total collection. Cattle grazing, sample depth and season of sampling influenced prostigmatid mite densities. However, grazing was the most significant factor, explaining 29% of the variation in prostigmatid mite density.

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683. Impact of cattle on two isolated fish populations in Pahrangat Valley, Nevada.

Taylor, Frances R.; Gillman, Leah A.; and Pedretti, John W. *Great Basin Naturalist* 49(4): 491-495. (1989)
 NAL Call #: 410 G79; ISSN: 0017-3614
Descriptors: habitat alterations/ grazing/ management/ research/ nitrogen/ pollution/ rivers and streams/ North America/ United States/ Nevada/ Nevada: Ash Springs/ Nevada: Brownie Spring/ Cichlasoma/ Cichlidae/ Cyprinidae/ Gambusia/ Poecilia/ Poeciliidae/ Rhinichthys/ Cichlasoma nigrofasciatum/ Crenichthys baileyi baileyi/ Gambusia affinis/ Poecilia mexicana/ Rhinichthys osculus
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684. Impact of grassland management on avian fauna.
 Baral, H. S.

In: Grassland ecology and management in protected areas of Nepal: Proceedings of a workshop. (Held 15 Mar 1999-19 Mar 1999 at Royal Bardia National Park, Thakurdwara, Bardia, Nepal.); Vol. Volume 2: Terai protected areas.; pp. 98-113; 2000.
 NAL Call #: QH193.N4 G73 2000
Descriptors: wetlands/ wild birds/ nature conservation/ burning/ controlled burning/ flooding/ grazing/ species diversity/ grassland management/ grasslands/ lowland grasslands
Abstract: Tall moist lowland grasslands are by far the most threatened habitat in Nepal and probably in the entire Indian subcontinent. More than one third of globally threatened bird species in Nepal live in lowland grasslands. Tall moist grasslands were surveyed at different times of the year for three consecutive years in three protected areas of lowland Nepal. A total of 219 species of birds were found to be using lowland grasslands at different times of year. The effects of management regimes such as fire, floods, and grazing were studied. The grassland management in lowland protected areas differed in space, time, and habitat scale. The effects of grassland management on avian fauna were studied. Better understanding of grassland dynamics is recommended to facilitate effective grassland management.
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685. The impact of grassland management on threatened butterflies in ESA's.

Warren, M. S. and Bourn, N. A. D.
 In: Grassland management in environmentally sensitive areas. (Held 23 Sep 1997-25 Sep 1997 at Lancaster, United Kingdom.) Sheldrick, R. D. (eds.); pp. 138-143; 1997.
 NAL Call #: SB197.B7; ISBN: 0905944542

686. The impact of grazing on spider communities in a mesophytic calcareous dune grassland.

Bonte, D.; Maelfait, J. P.; and Hoffmann, M.
Journal of Coastal Conservation 6(2): 135-144. (2000)
 NAL Call #: GC1080; ISSN: 1400-0350
Descriptors: twinspace: two way indicator species analysis, computer software/ pitfall traps: field sampling equipment/ ecological differentiation/ grazing impacts/ habitat preferences/ habitat variables/ juvenile development/ mesophytic calcareous dune grassland/ overwintering/ species diversity
Abstract: During 1994-1995 and 1997-1998 spiders were sampled with pitfall traps in a botanically rich, mesophytic,

calcareous dune grassland in Belgium. As a consequence of intensive cattle grazing, vegetation variation in a large part of the area had diminished. The study area was also patchily grazed by rabbits. Community analysis with TWINSpan revealed five distinct spider communities. Ecological differentiation was best explained by combination of the habitat variables: distance from grazed or non-grazed vegetation, *Rosa pimpinellifolia* cover and grass cover in both summer and winter. Species diversity was highest in the border zone between the cattle-grazed and non cattle-grazed sites. Correlation of the most abundant spider species with the vegetation determinants explains the ecological differentiation between the spider communities. Species were classified into seven major groups that reflect the species' habitat preferences. The group showing clear association with non cattle-grazed, tall vegetation consists of common species. Characteristic species for the intensively cattle-grazed sites are common aeronauts and rare species such as *Walckenaeria stylifrons*, *Mastigusa arietina*, *Ceratinopsis romana* and *Pardosa monticola*. The latter are shown to be dependent on ungrazed vegetation for juvenile development and overwintering. Intensive grazing results in homogeneous short vegetation, which can only be colonized by 'open ground' species with a well-developed dispersal capacity, or by species which are not dependent on litter-rich situations for juvenile development. An extensive cattle grazing regime results in a patchy mosaic grassland where, in addition to the above mentioned groups of species, other species survive by migrating between the buffered litter rich ungrazed vegetation and the short vegetation. Additionally, some typical and rare species prefer the transition zone between the grazed and the ungrazed vegetation because they are associated with specific habitat structures or inhabiting ant-species.

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687. Impact of livestock grazing on birds of a Colombian cloud forest.

Martin, T. E.
Tropical Ecology 25(2): 158-171. (1984)
 NAL Call #: 451 IN85; ISSN: 0564-3295
Descriptors: abundance/ understory/ density/ diversity/ rare species/ extinction/ susceptibility
Abstract: Mist-net lines were established in the understory of a secondary Colombian cloud forest, in areas where grazing pressure varied from none to severe, to examine the influence of grazing on abundance and diversity of birds. Increased grazing pressure resulted in decreased foliage density; ungrazed and lightly grazed areas had similar foliage densities while medium and severely grazed areas had much less foliage. Capture rates of birds (an index of abundance) were correlated with changes in foliage density; capture rates were similar between ungrazed and lightly grazed areas, but were much lower in medium and severely grazed areas. Numbers of captured bird species declined with increased grazing pressure and associated decreased understory vegetation density. In a comparison of this study with one by Ridgely and Gaulin (198) in an adjacent ungrazed primary forest, I found 7 species they did not record and they found 14 species that I did not record on my site. Many of these species were missed due to their rarity, but also because of effects of

grazing. I suggest the rarity and habitat specificity of tropical birds make them susceptible to increased extinctions from reduction of foliage due to grazing.

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688. The impact of livestock on lapwing *Vanellus vanellus* breeding densities and performance on coastal grazing marsh.

Hart, J. D.; Milsom, T. P.; Baxter, A.; Kelly, P. F.; and Parkin, W. K.

Bird Study 49(1): 67-78. (2002); ISSN: 0006-3657

Descriptors: grazing/ livestock/ marshes/ population density/ breeding sites/ breeding success/ agriculture/ environmental impact/ nature conservation/ population dynamics/ *Vanellus vanellus*/ northern lapwing/ livestock grazing/ aquatic birds

Abstract: Even at very low stocking densities, livestock reduce breeding densities of adult Lapwings and increase the risk of nest loss due to predation. To assess the effects of livestock on Lapwings breeding on coastal grazing marshes. Densities of breeding adults, clutch sizes, laying dates, incubation schedules, clutch and chick survival were compared between marshes grazed at low stocking densities (0.2-0.51 livestock units/ha) and marshes where livestock had been excluded. Repeated measurements of sward heights were also made. Breeding densities in 1995 and 1997, but not 1996, were negatively correlated with the presence of livestock. Though few nests were trampled, livestock disrupted incubation schedules and increased the risk of nest predation. Clutches were smaller on grazed marshes than on ungrazed marshes, while more clutches were also laid later on grazed marshes. Grazed swards remained shorter, and more suitable for nesting, longer than ungrazed swards but clutches laid later in the season were more likely to be predated. The exclusion of livestock from selected areas to increase the nesting success of lapwings is a desirable option on coastal grazing marshes where the rate of grass growth is slow in spring. Grazing regimes are suggested that would maintain relatively short swards, provide refuge to Lapwings from livestock during the peak nesting period, and allow grazers to exploit all of their marshes.

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689. Impact of precipitation and grazing on the water vole in the Beartooth Mountains of Montana and Wyoming, U.S.A.

Klaus, M.; Moore, R. E.; and Vyse, E.

Arctic, Antarctic, and Alpine Research 31(3): 278-282. (1999)

NAL Call #: GB395.A73; ISSN: 1523-0430

Descriptors: grazing/ mountain grasslands/ precipitation/ indicators/ survival/ watersheds/ nature conservation/ *Microtus richardsoni*

Abstract: The influence of increased precipitation levels and grazing on the demographics of *Microtus richardsoni* was examined. Water voles were trapped and marked during the summers of 1990, 1991 and 1992 along four headwater watersheds of the Clark's Fork of the Yellowstone River in Wyoming and Montana. The summer of 1992 had more than double the precipitation of either 1990 or 1991. During the wet summer of 1992, capture success was significantly greater, as was the proportion of young voles captured. In 1992, several factors contributed to increased water vole populations. There were

significantly more indications of male reproductive activity. Class I water voles (13-49 g) of both sexes showed signs of reproductive activity indicating they were reaching sexual maturity at smaller body mass. Significantly more embryos/trap-killed female were found. In 1995, the water vole was listed as a sensitive species because it is rare and requires specific alpine riparian habitat that is declining and may be damaged by poor grazing practices. Capture success was significantly greater, and there were significantly more young water voles in ungrazed drainages. Measured indicators of reproductive activity did not vary significantly between grazed and ungrazed drainages. It is concluded that grazing might affect survival of young water voles and should be studied further.

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690. The impact of recreational trails and grazing on small mammals in the Colorado piedmont.

Meaney, Carron A.; Ruggles, Anne K.; Clippinger, Norman W.; and Lubow, Bruce C.

Prairie Naturalist 34(3-4): 115-136. (2002)

NAL Call #: QH540 .P7; ISSN: 0091-0376

Descriptors: Akaiki's information criteria: mathematical and computer techniques/ analysis of variance: mathematical and computer techniques/ grazing/ recreational trails/ relative abundance/ species diversity/ species richness

Abstract: We conducted a three-year study of the impact of recreational trails and grazing on species richness, relative abundance, and species diversity of small mammals at six paired sites with and without trails along South Boulder Creek, Boulder, Colorado. In our analysis, we used a set of alternative models, which we evaluated using Akaiki's Information Criteria (AIC) to compute strength of evidence supporting each alternative and then made all inferences based on weighted averages of these model results. Our data provided strong evidence for an increase (2.0 individuals per 100 trap nights \pm 0.51 SE) of deer mice (*Peromyscus maniculatus*) on the grazed sites, but little evidence for effects on relative abundance of other species or on species richness or diversity. Repeated measures ANOVA results for paired trail and non-trail sites showed only weak evidence for a negative effect of trails on species richness, species diversity, and relative abundance. In addition to small mammal trapping, we employed mark-recapture techniques on Preble's meadow jumping mouse (*Zapus hudsonius preblei*), a federally listed threatened subspecies of the meadow jumping mouse, to determine linear population density estimates of this subspecies on the trail and non-trail sides of the creek. Repeated measures ANOVA for these density estimates provided weak evidence for a possible negative trail effect (-11.6 individuals/km \pm 9.5 SE) that was greater in males than females. Although the low precision of these estimates makes the results inconclusive, the magnitude of the estimated effect (a 31% lower population density of Preble's meadow jumping mice on sites with trails) highlights the need for careful management and additional research. Our data revealed large natural temporal and spatial variation in these populations that resulted in poor precision of estimated effects of interest.

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691. Impacts of a late season grazing scheme on nongame wildlife in a Wallowa Mountain riparian ecosystem.

Kauffman, J. B.; Kreuger, W. C.; and Vavra, M.
In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.)
Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 208-220; 1982.
NAL Call #: SF84.84.W5 1981

692. The implications of grassland and heathland management for the conservation of spider communities: A review.

Bell, J. R.; Wheeler, C. P.; and Cullen, W. R.
Journal of Zoology 255(3): 377-387. (2001)
NAL Call #: QL1.J68; ISSN: 0952-8369
Descriptors: grassland management/ grasslands/ grazing/ habitats/ wildlife conservation
Abstract: Both intensity and type of habitat management in grasslands and heathlands affect spider communities. With high intensity management, spider communities often lack diversity and are dominated by a few r-selected species affiliated with bare ground. Low intensity management produces more complex communities introducing more niches for aerial web spinners and climbing spiders. The preferred management will be site-dependent and may not be appropriate for all spiders in all situations, particularly for some rare or threatened species. Providing natural cover is recommended when using extreme forms of management or intensive grazing (particularly by sheep). In extreme cases, or where trampling is heavy, the litter layer should be conserved. We advocate research and survey before and after major management implementation. Habitat management for spiders should not be considered alone, but integrated into a holistic plan. Management for spiders may conflict with rare plant conservation and small reserves should examine the viability of providing two contrasting regimes.
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693. Implications of grazing and burning of grasslands on the sustainable use of francolins (*Francolinus* spp.) and on overall bird conservation in the highlands of Mpumalanga Province, South Africa.

Jansen, R.; Little, R. M.; and Crowe, T. M.
Biodiversity and Conservation 8(5): 587-602. (1999)
NAL Call #: QH75.A1B562; ISSN: 0960-3115
Descriptors: annual burning: management method/ conservation implications/ grasslands: habitat/ grazing intensity/ land use/ landscape scale/ species density/ species distribution/ species richness/ stocking rate/ sustainable use
Abstract: We investigated the densities of the Redwing *Francolinus levaillantii* and Greywing *Francolinus* *F. africanus* and the diversity of grassland birds in general along a land-use gradient in the highlands of Mpumalanga province, South Africa. Redwing *Francolins* cannot tolerate intensive grazing and frequent burning and are confined largely to unburnt, ungrazed grasslands. Their density and the species richness of grassland birds in general are negatively correlated with grazing intensity. Redwing populations drop to densities that cannot be utilised by hunters on a sustainable basis in grasslands that are grazed at even moderate levels or burned annually.

Nineteen bird species (including five threatened species) were confined to essentially pristine grassland and were never observed in grazed/annually burned grasslands. The Greywing *Francolin* is more evenly distributed (although always at sub-utilisation densities) along the grassland land-use gradient, and its density is positively correlated with grazing intensity. There are two assemblages of grassland bird species that appear to be indicative of the intensity of habitat utilisation. Populations of grassland birds in the study area are becoming increasingly dependent on isolated patches of pristine grassland and are threatened by management involving annual burning and high stocking rates on a landscape scale.
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694. The implications of grazing and predator management on the habitats and breeding success of black grouse *Tetrao tetrix*.

Baines, David
Journal of Applied Ecology 33(1): 54-62. (1996)
NAL Call #: 410 J828; ISSN: 0021-8901
Descriptors: moorland
Abstract: 1. Data on black grouse densities and breeding success were collected from five blocks of moorland, each consisting of four moors, between 1991 and 1993. Moors within a block differed in grazing intensity of either sheep or red deer and the presence of a gamekeeper. Results obtained were related to differences in grazing and predator management. 2. Moors with higher intensities of grazing had vegetation, on average, 32% shorter and had 36% less vertical vegetation cover. Grazing had no significant effect on species composition. 3. Heavily grazed moors supported 41% fewer invertebrates; threefold fewer Lepidoptera larvae and half as many Araneae and Hemiptera. 4. Highest densities of male (2-1 km⁻²) and female black grouse (3.4 km⁻²) were found on lightly grazed moors. Density did not differ between kept and unkept moors. 5. Black grouse breeding success not only differed between years and regions, but also between managements, being 37% lower on heavily grazed moors. The presence of a gamekeeper was not associated with higher breeding success. 6. The presence of a gamekeeper was associated with three times fewer carrion crows. 7. The results suggest that lower numbers of large herbivores allow the development of good ground cover with high numbers of preferred insects, which may permit black grouse to survive in situations where they would otherwise be severely reduced by predators.
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695. Improvement of Great Basin deer winter range with livestock grazing.

Neal, D. L.
In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.)
Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 61-73; 1982.
NAL Call #: SF84.84.W5 1981

696. Influence of cattle grazing on population density and species richness of granivorous birds (Emberizidae) in the arid plain of the Monte, Argentina.

Marcelo Gonnet, Jorge

Journal of Arid Environments 48(4): 569-579. (2001)

NAL Call #: QH541.5.D4J6; ISSN: 0140-1963

Descriptors: animals and man/ disturbance by man/ commercial activities/ ecology/ community structure/ population dynamics/ habitat/ terrestrial habitat/ land and freshwater zones/ Neotropical Region/ South America/ Emberizidae: farming and agriculture/ cattle grazing/ species diversity/ population density/ grassland/ scrub/ Argentina/ Mendoza/ population density and species diversity/ cattle grazing effects/ arid shrub grassland/ Emberizidae/ Passeriformes/ Aves/ birds/ chordates/ vertebrates

Abstract: Cattle grazing is an important disturbance in the Monte plain, reducing grass biomass and rates of fruit setting. Grass seeds are the most important food for granivorous birds (Emberizidae) during winter. The objective of this study was to test whether granivorous bird populations (Emberizidae), grass seed production, and vegetation structure differed at sites with different intensities of grazing. Emberizid density and species richness were higher in the ungrazed site than in the two grazed paddocks. Seed abundance was also higher in ungrazed vs. grazed sites. Woody vegetation, that serve as safe nest sites, did not differ among treatments.

Granivorous bird populations seemed to be affected by cattle grazing; however, the main mechanisms of this process remain unknown.

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697. The influence of cattle grazing on xerotherm grasshopper populations of river dunes near Overasselt, the Netherlands.

Offereins, H. R. and Wingerden, W. K. R. E.

Proceedings of the Section Experimental and Applied Entomology of the Netherlands Entomological Society 6: 59-64. (1995)

NAL Call #: QL461.P76

Descriptors: grazing/ effects/ heathlands/ grassland management/ grasslands/ nature conservation/ wild plants/ agricultural entomology/ Myrmeleotettix maculatus/ Netherlands Entomological Society/ Myrmeleotettix

Abstract: Comparison of grasshopper populations of parts of a heathland nature reserve near Nijmegen, Netherlands, grazed or ungrazed by cattle, showed a higher number of Myrmeleotettix maculatus on grazed parts. Four other acridid species were found in such small numbers that analysis of relations with grazing intensity was impossible.

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698. Influence of cattle stocking rate on the structural profile of deer hiding cover.

Loft, E. R.; Menke, J. W.; Kie, J. G.; and Bertram, R. C.

Journal of Wildlife Management 51(3): 655-664. (1987)

NAL Call #: 410 J827; ISSN: 0022-541X

Descriptors: Odocoileus hemionus californicus/ Odocoileus hemionus hemionus/ Populus tremuloides/ Salix spp./ Veratrum californicum/ fawn/ meadow/ riparian habitat/ grazing habitat deterioration/ Sierra Nevada/ California/ USA

Abstract: Hiding cover available for California (Odocoileus hemionus californicus) and Rocky Mountain (O. h. hemionus) mule deer was monitored during summer under no, moderate, and heavy cattle stocking rates in quaking aspen (Populus tremuloides) and meadow-riparian habitats in the central Sierra Nevada, California [USA]. Use of willow (Salix spp.) and herbaceous vegetation in meadow-riparian habitat was also measured using exclosure plots. Hiding cover in aspen and corn lily (Veratrum californicum) vegetation types was not reduced through mid-season in ungrazed treatments but was significantly ($P < 0.05$) reduced under moderate and heavy grazing. Increases in cover of aspen understory were detected after 2 years of cattle exclusion. Willow vegetation was resilient to the impacts of cattle under moderate grazing, but hiding cover was significantly ($P < 0.05$) reduced with heavy stocking rates. Browsing of willows by deer was light in ungrazed treatments but increased as the season progressed in cattle-grazed areas and as stocking rate increased. Natural weathering was partly responsible for overall hiding cover lost during the summer but reductions prior to mid-summer were attributed to cattle. The high proportion of hiding cover lost early in the season coincided with the 1st 2 months of life for fawns.

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699. Influence of grazing by bison and cattle on deer mice in burned tallgrass prairie.

Matlack, Raymond S.; Kaufman, Donald W.; and

Kaufman, Glennis A.

American Midland Naturalist 146(2): 361-368. (2001)

NAL Call #: 410 M58; ISSN: 0003-0031

Descriptors: animals and man/ disturbance by man/ commercial activities/ nutrition/ diet/ ecology/ population dynamics/ habitat/ terrestrial habitat/ abiotic factors/ physical factors/ land and freshwater zones/ Nearctic Region/ North America/ USA/ Bos bison (Bovidae): food plants/ impact on habitat/ grassland/ Kansas/ Flint Hills/ Konza Prairie Biological Station/ grazing impact on small mammalian population size/ tallgrass prairie habitat/ Bovidae/ Artiodactyla/ Mammalia/ chordates/ mammals/ vertebrates

Abstract: We studied the influence of grazing by bison (Bos bison) and by cattle (B. taurus) on deer mice (Peromyscus maniculatus) in tallgrass prairie at the Konza Prairie Biological Station in 1997 and 1998. Small mammals were sampled by one 10-station trapline in each of four bison-grazed enclosures, four cattle-grazed enclosures and four ungrazed sites. Enclosures were 4.9 ha and the biomass of grazers in each was similar. All sites were burned annually. We sampled small mammals for 4 consecutive nights in spring before fire, in spring after fire and in autumn. Deer mice were the most abundant species ($n=285$; 83% of all small mammals) captured in all treatments and in each trapping period. Deer mice were significantly more abundant in bison-grazed and cattle-grazed sites than in ungrazed sites in spring before fire ($P < 0.01$ and $P < 0.05$, respectively), but were similar in abundance in grazed and ungrazed sites following fire. Abundance of deer mice was significantly higher in bison-grazed sites than in cattle-grazed and ungrazed sites in autumn ($P < 0.05$ and $P < 0.001$, respectively). Bison and cattle differ in grazing and nongrazing behaviors (e.g., wallowing by bison) that result in differences in vegetation structure. It is likely that differences in deer mouse abundance between bison-

grazed and cattle-grazed treatments were due to differences in vegetation structure caused by the two types of grazers.

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700. Influence of grazing systems on waterfowl production.

Hertel, D. and Barker, W. T.

Proceedings of the North Dakota Academy of Science 41(79): 6. (1987)

NAL Call #: 500 N813; ISSN: 0096-9214

Descriptors: cattle/ waterfowl/ grazing/ range management/ wildlife management/ North Dakota

This citation is from AGRICOLA.

701. Influence of grazing treatments on nongame birds and vegetation structure in south central North Dakota.

Messmer, Terry Allan North Dakota State University, 1991.

Descriptors: behavior/ breeding/ birds/ habitat use/ habitat alterations/ grazing/ livestock/ habitat disturbance/ habitat changes/ *Ammodramus savannarum*/ food supply/ North America/ United States/ North Dakota/ North Dakota, Southcentral

© NISC

702. Influence of livestock grazing on grasshopper (Orthoptera: Acrididae) diversity in the Inner Mongolian steppes.

Kang Le

Chinese Biodiversity 2(Supplement): 9-17. (1994)

Descriptors: insect pests/ plant pests/ species diversity/ habitats/ grazing intensity/ indicator species/ plant communities/ ecology/ grasslands/ steppes/ nature conservation/ grazing/ fodder plants/ biology/ geographical distribution/ agricultural entomology

Abstract: Vegetation and Acrididae community variables were monitored on natural steppes grazed by livestock in Inner Mongolia [Nei Menggu], China. Species richness, diversity and evenness of acridids on the plots under different grazing intensities were compared. Change in plant community directly affected the species composition of acridids. However, floral parameters were not entirely parallel to characteristics of the acridid community. Moderate grazing could preserve a greater diversity of acridids with a lower proportion of pest species. The importance of some acridid indicators to grassland change was discussed.

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703. Influence of livestock grazing on the capybara's trophic niche and forage preferences.

Quintana, Ruben Dario

Acta Theriologica 47(2): 175-183. (2002)

NAL Call #: 410 AC88; ISSN: 0001-7051

Descriptors: animals and man/ disturbance by man/ commercial activities/ nutrition/ diet/ feeding behaviour/ ecology/ land and freshwater zones/ Neotropical Region/ South America/ *Hydrochaeris hydrochaeris* (*Hydrochaeridae*): farming and agriculture/ livestock grazing/ food plants/ food availability/ food preferences/ foraging/ trophic structure/ ecological niche/ trophic niche/ effect of livestock grazing/ Argentina/ east central/ livestock grazing effect on foraging/ *Hydrochaeridae*/ *Rodentia*/ *Mammalia*/ chordates/ mammals/ vertebrates

Abstract: Trophic niche parameters and forage preferences

of capybara *Hydrochaeris hydrochaeris* Linnaeus, 1766 were studied at three areas of east-central Argentina: Lower Delta Islands (LDI), only capybara present; Puerto Constanza (PC), capybara and cattle, and Villaguay (VI), capybara, cattle and sheep. Significant correlation was found in the annual botanical composition of capybara faeces at LDI and PC, but no correlation was found between faecal composition at these two areas and those at VI. The narrowest trophic niche corresponded to LDI, while the widest corresponded to VI, with significant differences in the values among the three areas. Capybara consumed *Carex riparia*, *Cynodon dactylon* and *Panicum grumosum* in LDI, and *P. milioides* in VI in proportion greater than availability. Three and eight food items were consumed less than availability in VI and PC, respectively. The greater the species number and density of livestock animals, the more generalist the behavior of capybara, possibly due to direct interaction in the use of grazing resources. Changes in availability of foraging species may influence the capybara's preference patterns and the consumption of suboptimal feeding items may indicate a greater pressure on foraging resources in the areas where capybaras share their habitat with livestock.

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704. The influence of management practises on the microarthropod community of grassland.

Siepel, H. and Bund, C. F. van de

Pedobiologia 31(5/6): 339-354. (1988)

NAL Call #: 56.8 P343; ISSN: 0031-4056

Descriptors: *Collembola*/ *Acari*/ arthropods/ soil fauna/ grassland soils/ population dynamics/ range management/ grazing/ mowing/ fertilizer application

This citation is from AGRICOLA.

705. Influence of rest-rotation cattle grazing on mule deer and elk habitat use in east-central Idaho.

Yeo, J. J.; Peek, J. M.; Wittinger, W. T.; and Kvale, C. T.

Journal of Range Management 46(3): 245-250. (1993)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1993/463/10yeo.pdf>

Descriptors: grazing systems/ selective grazing/ wild animals/ rest rotation grazing/ grazing behaviour

Abstract: Elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*) and cattle (*Bos taurus*) distributions were determined year round from 1975 to 1979 on a rest-rotation grazing system established in steep mountainous terrain. Following implementation of the grazing system, cattle progressively used higher altitudes and steeper slopes in each succeeding year. Elk preferred rested pastures during the grazing season (June-Oct.) and avoided habitat frequented by cattle by using higher altitudes and steeper slopes. Few mule deer used the allotment during summer, but during the winter, deer selected habitats grazed previously by cattle. Elk appeared to adjust to the grazing system by making greater use of pastures with cattle present, although preference for pastures without cattle continued.

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706. Influences of livestock grazing on sage grouse habitat.

Beck, Jeffrey L. and Mitchell, Dean L.

Wildlife Society Bulletin 28(4): 993-1002. (2000)

NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: habitat/ livestock grazing

Abstract: Livestock grazing has been identified as one factor associated with the widespread decline and degradation of sage grouse (*Centrocercus urophasianus*) habitat. We identified $n = 17$ positive and negative impacts of livestock on sage grouse and habitat. Little information is currently available concerning the direct impacts of livestock grazing on sage grouse habitat. Indirect impacts are better understood than direct impacts. Chemical and mechanical treatments intended to provide increased quantities of grass forage for livestock have indirectly reduced the acceptability of sagebrush (*Artemisia* spp.) rangelands for sage grouse. Our paper examines: 1) potential mechanisms whereby livestock grazing in big sagebrush (*A. tridentata*) communities can modify sage grouse habitat and 2) the indirect influences of livestock production on sage grouse habitat. Overall, livestock grazing appears to most affect productivity of sage grouse populations. Residual grass cover following grazing is essential to conceal sage grouse nests from predators. Future research needs are identified and management implications related to livestock grazing in sage grouse habitats are included.

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707. Insect diversity in two burned and grazed grasslands.

Fay, Philip A.

Environmental Entomology 32(5): 1099-1104. (2003)

NAL Call #: QL461.E532; ISSN: 0046-225X

Descriptors: Sorensen's Similarity Index: mathematical and computer techniques/ sweep sampling: applied and field techniques/ burning/ grazing/ species diversity/ species richness/ tallgrass prairie

Abstract: This study examined insect diversity in two native grassland ecosystems undergoing burning and grazing by bison and cattle, the Niobrara Valley Preserve (Nebraska) and the Tallgrass Prairie Preserve (Oklahoma). Sweep-sampling for insects was conducted during July 1994 and 1995 along transects in management units that were grazed by bison and partially burned, grazed by cattle and either burned (Tallgrass) or unburned (Niobrara), or ungrazed and unburned. At both sites, species richness (S) and diversity (log series alpha) were higher and similarity (Sorensen's index) lower for bison than for cattle or ungrazed management units. High bison management unit diversity was associated with significantly higher S and alpha in burned (Tallgrass) and unburned (Niobrara) portions of bison units compared with their respective cattle units, suggesting that habitat heterogeneity in terms of plant productivity, composition, and structure were higher in bison versus cattle and ungrazed management units. Replicated factorial experiments and sampling of additional taxa and time points are needed to verify how fire and grazing management impacts insect diversity in these grasslands.

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708. Is the density of redshank *Tringa totanus* nesting on saltmarshes in Great Britain declining due to changes in grazing management?

Norris, Ken; Brindley, Emma; Cook, Tony; Babbs, Stephen; Brown, Christopher Forster; and Yaxley, Robert

Journal of Applied Ecology 35(5): 621-634. (1998)

NAL Call #: 410 J828; ISSN: 0021-8901

Descriptors: multiple regression modeling: statistical method/ grazing intensity: conservation implications/ saltmarsh: grazing management, habitat

Abstract: 1. Saltmarsh habitats support c. 50% of the population of redshank *Tringa totanus* breeding in Britain. Between 1985 and 1996, breeding densities declined significantly by 23%. This paper tests the hypothesis that this decline resulted from changes in the extent of important saltmarsh habitats for nesting redshank, and/or a change in the intensity of grazing. 2. We surveyed breeding redshank densities, the extent of saltmarsh habitats, and the intensity of grazing on a sample of 77 saltmarsh sites around the coast of Britain in 1985 and 1996. From these data, we constructed statistical models that described breeding densities in relation to a range of habitat and grazing variables for each of the surveys, and examined changes in breeding density between the surveys, in relation to changes in the important habitat and grazing variables included in these models. 3. During both surveys, breeding densities were lowest on heavily grazed plots, and there was some evidence, from the larger number of survey sites for which data were available in 1985, that breeding densities tended to be highest on lightly grazed saltmarsh. Multiple regression modelling, incorporating a range of habitat variables and grazing intensity, also showed this effect, although in 1996 interpretation of the relationship between breeding density and grazing intensity was complicated because both grazing intensity and a habitat variable accounted for a similar component of the variance in breeding density. These models also showed that certain habitat variables were significant correlates of breeding density, particularly the extent of seacouch grass, which was positively correlated with breeding density in both survey years. During 1985, breeding densities were also correlated with the extent of a number of other saltmarsh habitats, which did not significantly correlate with breeding densities in 1996. In addition to the measured habitat and grazing variables, densities also showed significant regional variation in Britain during both surveys. 4. Of the habitat and grazing variables included in the multiple regression models of breeding density, only the intensity of grazing changed between 1985 and 1996, showing a significant increase. Breeding densities declined most markedly on sites that had experienced an increase in the intensity of grazing from ungrazed/lightly grazed to moderate/heavily grazed. This suggests that an increase in the intensity of grazing was the most likely explanation for the decline in breeding densities observed between 1985 and 1996. Causal explanations for the increase in grazing intensity are discussed. 5. Assuming that the grazing intensity data were representative of grazing management on saltmarshes throughout Britain, then we estimate that 1665 ha of saltmarsh experienced an increase from ungrazed/light grazing to moderate/heavy grazing over the 11 years between 1985 and 1996. This is comparable to the 2100 ha of saltmarsh that are expected to be lost to erosion over the next 20 years. We also estimate that 6388 ha, or 14.6%, of saltmarsh in Britain was heavily grazed in 1996. 6. Our analysis of the redshank survey data, together with these

figures, suggest that heavy grazing is a significant threat to saltmarsh habitats and its breeding redshank, on a national scale at present. We urgently need a detailed assessment of the grazing management of saltmarshes in Britain, and how grazing management is affected by agricultural policy, as a precursor for the introduction of provisions to ensure that the decline in breeding redshank does not continue.
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709. Leaf miner assemblies effects of plant succession and grazing management.

Sterling, P. H.; Gibson, C. W. D.; and Brown, V. K.

Ecological Entomology 17(2): 167-178. (1992)

NAL Call #: QL461 .E4; ISSN: 0307-6946

Descriptors: insect/ secondary succession/ calcareous grassland

Abstract: Changes in leaf-miner assemblies during 4 years of secondary succession, under different controlled sheep-grazing treatments, are described and compared to the miner fauna of older grazed grassland nearby. 2.

Multivariate analyses were used in conjunction with examination of individual common species to assess the independent effects of time, grazing treatment, plant species composition and architecture on the leaf-miner assemblies. 3. Leaf-miner species composition was strongly related to plant species composition, but was modified by plant structure under different grazing treatments. There was a strong successional trend in miner assemblies, even when the effects of changes in plant composition had been taken into account. Conversely, local variation in miner species composition generally reflected foodplant distribution alone. 4. Grazed treatments had fewer mines than controls, but there were also species specializing in grazed areas, despite the abundance of their foodplants elsewhere. There was a weak indication that miner species in grazed treatments were more likely to fluctuate in abundance than those in controls. 5. The results are discussed in relation to the assembly of grassland insect communities during succession, and the use of 'indicator groups' in management for nature conservation.
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710. A literature review of insect responses to fire, compared to other conservation managements of open habitat.

Swengel, Ann B.

Biodiversity and Conservation 10(7): 1141-1169. (2001)

NAL Call #: QH75.A1B562; ISSN: 0960-3115

Descriptors: haying: management method/ mowing: management method/ conservation management/ ecological adaptations/ grasslands/ grazing intensity/ insect responses/ niche diversity/ open habitats: burning/ recolonization/ savannas/ vegetational composition/ vegetational structure/ wildfires

Abstract: This literature review concerns insect responses to fire, compared to other feasible and appropriate conservation managements of open habitats. Many insect groups decline markedly immediately after fire, with the magnitude of reduction related to the degree of exposure to the flames and mobility of the insect. Niche diversity is lower in recently burned habitat, and the rate of insect increase following fire also relates to the species' ability to gain access to the regrowing vegetation. Postburn flora can be quite attractive to some recolonizing insects, possibly to some degree a result of fire-caused insect mortality which

provides plants with short-term release from insect herbivory. Insect declines may follow immediately after mowing, but usually of lesser degree and shorter duration than after a fire of comparable timing and size. Season and scale of cutting may affect how much and which species showed positive or negative responses. Cut areas offer the vegetational structure and composition preferred by some insects, but cutting-or cutting at certain scales, seasons, or frequencies-may also be unfavorable for some species. Heavy grazing results in niche and assemblage simplification. Nonetheless, some invertebrates prefer the short turfs and bare ground resulting from heavier grazing. Other species vary in whether they peak in abundance and diversity in intermediate, light, or no grazing. In comparisons of mowing/haying and grazing regimes of similar compatibility with maintenance of the same habitat types, responses of particular species and species groups varied as to whether they had a preference for one or the other. Characteristics associated with insect responses to fire related to the degree of exposure to lethal temperature and stress experienced in the post-fire environment, suitability of post-treatment vegetation as habitat, and ability to rebuild numbers in the site (from survivors and/or colonizers). These factors appear equally useful for explicating insect responses to other managements such as haying, mowing, and grazing. By contrast, the assumption that the most habitat-restricted species will be most adapted to ecological forces believed to be prevalent in that ecosystem appears less efficacious for predicting insect management preferences.

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711. Livestock as manipulators of mule deer winter habitats in northern Utah.

Urness, P. J.

In: Can livestock be used as a tool to enhance wildlife habitat? (Held 13 Feb 1990 at Reno, Nev.)

Severson, Kieth E. (eds.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, US Department of Agriculture, Forest Service; pp. 25-40; 1990.

Notes: 43rd Annual Meeting of the Society for Range Management

NAL Call #: aSD11.A42 no.194

Descriptors: animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ nutrition/ diet/ habitat/ terrestrial habitat/ land and freshwater zones/ Nearctic Region/ North America/ USA/ *Odocoileus hemionus* (Cervidae): farming and agriculture/ livestock grazing/ conservation aspects/ habitat management/ food plants/ important species changes/ conservation role of livestock grazing/ grassland/ heathland/ Utah/ north/ winter habitat manipulation by livestock grazing/ Cervidae/ Artiodactyla/ Mammalia/ chordates/ mammals/ vertebrates

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712. Livestock as tools for managing big game winter range in the intermountain West.

Urness, P. J.

In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 20-31; 1982.
NAL Call #: SF84.84.W5 1981

713. Livestock effects on reproduction of the Columbia spotted frog.

Bull, E. L. and Hayes, M. P.

Journal of Range Management 53(3): 291-294. (2000)
NAL Call #: 60.18 J82; ISSN: 0022-409X
http://jrm.library.arizona.edu/data/2000/533/291-294_bull.pdf

Descriptors: Rana/ ponds/ oval/ grazing/ cattle/ aquatic plants/ surface area/ altitude/ depth/ fish/ habitats/ algae and seaweeds/ dissolved oxygen/ Oregon
This citation is from AGRICOLA.

714. Livestock exclusion: Consequences on nocturnal rodents in Baja California Sur.

Ortega Rubio, Alfredo; Romero Schmidt, Heidi; Arguelles Mendez, Cerafina; Coria Benet, Rocio; and Solis Marin, Francisco

Revista de Biología Tropical 41(3B): 907-909. (1994)
NAL Call #: 442.8 R328; ISSN: 0034-7744

Descriptors: animals and man/ disturbance by man/ commercial activities/ biometrics/ ecology/ population dynamics/ land and freshwater zones/ Nearctic Region/ North America/ Perognathus spinatus (Heteromyidae)/ Neotoma lepida/ Peromyscus eva (Muridae): farming and agriculture/ livestock grazing exclusion/ size and weight relationships/ size/ weight/ population density/ Mexico/ Baja California Sur/ La Sierra de la Laguna/ size and weight/ livestock grazing exclusion effects/ Heteromyidae/ Rodentia/ Mammalia/ chordates/ mammals/ vertebrates
© The Thomson Corporation

715. Livestock grazing.

Platts W. S. and Meehan W. R.

In: Influences of forest and rangeland management on salmonid fishes and their habitats.
Bethesda: American Fisheries Society, 1991; pp. 389-423
NAL Call #: SH167.S17I53 1991
Descriptors: pollution/ sewage/ ecological/ fishes
© NISC

716. Livestock grazing: A tool to improve wildlife habitat.

Severson, Kieth E. and Urness, Philip J.

In: Ecological implications of livestock herbivory in the West/ Vavra, Martin; Laycock, William A.; and Pieper, Rex D.
Denver, Colo.: Society for Range Management, 1994; pp. 232-249
NAL Call #: SF85.35.A17E28 1994
Descriptors: animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ land and freshwater zones/ Nearctic Region/ North America/ comprehensive zoology: farming and

agriculture/ habitat management/ livestock grazing use/ USA/ west/ livestock grazing use to improve wildlife habitat/ review

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717. Livestock grazing affects the egg size of an insectivorous passerine.

Evans, Darren M.; Redpath, Stephen M.; Evans, Sharon A.; Elston, David A.; and Dennis, Peter

Biology Letters 1(3): 322-325. (2005); ISSN: 1744-9561
Descriptors: animals and man/ disturbance by man/ commercial activities/ biometrics/ reproduction/ land zones/ Palaearctic Region/ Eurasia/ United Kingdom/ Europe/ Anthus pratensis (Motacillidae): farming and agriculture/ sheep grazing pressure/ effects on egg size and reproductive productivity/ size/ volume/ weight/ egg/ egg size/ reproductive productivity/ Scotland/ Glen Finglas/ effects of sheep grazing pressure on egg size and reproductive productivity/ Motacillidae/ Passeriformes/ Aves/ birds/ chordates/ vertebrates

Abstract: Livestock grazing is a major driver of ecosystem change, and has been associated with significant declines in various bird species worldwide. In Britain, there is particular concern that severe grazing pressure is deleteriously affecting vegetation and birds in upland regions. However, the mechanism by which grazing affects birds is unclear. Here, we report for the first time, to our knowledge, that sheep grazing pressure affects the egg size of a common upland passerine: the meadow pipit *Anthus pratensis*. We manipulated sheep stocking densities in a replicated field experiment, and found that plots with the highest stocking density contained nests with the smallest eggs, and that plots with low stocking density contained nests with the largest eggs. However, eggs laid in ungrazed plots were also small, suggesting that either too many sheep or their removal from upland areas might have a detrimental effect on pipit egg size. We found no significant effect on fledging success but the reduced post-fledging survival of young from smaller eggs, as seen in other studies, could partly explain declines in upland birds.
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718. Livestock grazing effects on ant communities in the Eastern Mojave Desert, USA.

Nash, Maliha S.; Bradford, David F.; Franson, Susan E.; Neale, Anne C.; Whitford, Walter G.; and Heggem, Daniel T.

Ecological Indicators 4(3): 199-213. (2004); ISSN: 1470-160X

Descriptors: animals and man/ disturbance by man/ commercial activities/ ecology/ habitat/ terrestrial habitat/ land zones/ Nearctic Region/ North America/ Formicidae: farming and agriculture/ livestock grazing/ community structure/ livestock grazing effect/ environmental indicator significance/ environmental indicators/ desert habitat/ USA/ Mojave Desert/ effect of livestock grazing/ environmental indicator significance/ Formicidae/ Formicoidea/ Aculeata/ Apocrita/ Hymenoptera/ Insecta/ arthropods/ hymenopterans/ insects/ invertebrates

Abstract: The effects of livestock grazing on composition and structure of ant communities were examined in the eastern Mojave Desert, USA for the purpose of evaluating ant communities as potential indicators of rangeland condition. Metrics for ant communities, vegetation, and other ground-cover elements were evaluated as a function

of distance from livestock water tanks, which represents a gradient in level of livestock activity in desert settings. Data were collected at six isolated water tanks used by cattle during early summer, with seven plots (90 m + 90 m; 100 pitfall traps) per tank. Thirty-eight species of ants were recorded, with an average of 14 ant species per plot. Ant species richness did not differ as a function of distance from the water tank. Also, overall species composition, as measured by a similarity index for species presence/absence for paired-comparisons of plots, did not show differences attributable to the gradient in grazing impact. In contrast, the relative abundance of several taxa and functional groups was significantly related to distance from the water tank. The predominant pattern was for the greatest abundance to occur at the water tank, with little difference in ant abundance among plots away from the water tank. This pattern was shown by the abundant ants species, *Conomyrma bicolor* and *Pheidole tucsonica*, and the groups *Conomyrma* spp., *Pheidole* spp., homopteran tenders, and plant foragers. However, two species, *Aphaenogaster megommata* and *Monomorium wheelerorum* showed the greatest relative abundance at a distance away from the water tank. A number of ant metrics were significantly related to ground-cover metrics ($R^2 > 0.5$). Organic debris was the variable most frequently related significantly to ant abundance metrics, always in a positive direction, followed by cover for perennial grasses, annual forbs, and shrubs, and bare patch size. Ant community metrics in the study region appear to have little potential to serve as indicators of rangeland condition because differences were evident primarily in severely degraded localized conditions rather than in intermediate widespread conditions.

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719. Livestock grazing effects on forage quality of elk winter range.

Clark, P. E.; Krueger, W. C.; Bryant, L. D.; and Thomas, D. R.

Journal of Range Management 53(1): 97-105. (2000)

NAL Call #: 60.18 J82; ISSN: 0022-409X

http://jrm.library.arizona.edu/data/2000/531/97-105_clark.pdf

Descriptors: sheep/ grazing/ *Pseudoroegneria spicata*/ *Carex*/ *Festuca idahoensis*/ stocking rate/ *Cervus elaphus*/ rain/ stems/ in vitro digestibility/ crude protein/ biomass/ canopy/ savannas/ shrubs/ forage/ Oregon

Abstract: Carefully-managed livestock grazing has been offered as a tool to improve the forage quality of graminoids on big game winter range. Formal testing of this theory has thus far been done using hand clippers rather than livestock grazing. We report winter standing reproductive culm, crude protein, in vitro dry matter digestibility, and standing crop responses of bluebunch wheatgrass (*Agropyron spicatum* [Pursh] Scribn. & Smith), Idaho fescue (*Festuca idahoensis* Elmer), and elk sedge (*Carex geyeri* Boott) to late-spring domestic sheep grazing. The study was conducted in 1993 and 1994 on a big game winter range in the Blue Mountains of northeastern Oregon. Sheep grazing and exclusion treatments were applied to 20-ha plots at 3 sites on the study area Targeted utilization for grazed plots was 50% graminoid standing crop removal during the boot stage of bluebunch wheatgrass. Grazing did not influence the number of standing reproductive culms per plant in bluebunch wheatgrass. Crude protein and in vitro dry

matter digestibility of bluebunch wheatgrass in grazed plots increased by 1.0 and 4.3 percentage points, respectively over ungrazed plots. Grazing reduced the standing crop of bluebunch wheatgrass by 116.9 kg ha⁻¹ DM. Standing Idaho fescue reproductive culms decreased by 0.7 culms plant⁻¹ under grazing. Crude protein of Idaho fescue in grazed plots was 1.3 percentage points greater than in ungrazed plots. Crude protein and in vitro dry matter digestibility responses of elk sedge were inconsistent between years and may be related to utilization or growth differences between years. The levels of forage quality improvement in bluebunch wheatgrass and Idaho fescue obtained in this study could benefit the nutritional status of wintering Rocky Mountain elk (*Cervus elaphus nelsoni* Bailey). More research is needed regarding the effects of grazing on the winter forage quality of elk sedge. This citation is from AGRICOLA.

720. Livestock grazing, golden trout, and streams in the Golden Trout Wilderness, California: Impacts and management implications.

Knapp, R. A. and Matthews, K. R.

North American Journal of Fisheries Management 16(4): 805-820. (1996)

NAL Call #: SH219.N66; ISSN: 0275-5947

Descriptors: freshwater fish/ population density/ water quality/ land use/ USA, California/ canopy shading/ livestock/ grazing/ trout/ ecological effects/ resources management/ freshwater fish/ fluvial morphology/ plant populations/ vegetation cover/ fishery management/ predators/ *Oncorhynchus aguabonita*/ degradation/ physical properties/ environmental effects

Abstract: Impacts of livestock grazing on California golden trout *Oncorhynchus mykiss aguabonita* and their habitat were studied inside and outside of livestock exclosures in the Golden Trout Wilderness, California. In two consecutive years, the majority of stream physical characteristics showed large differences between grazed and ungrazed areas, and the directions of these differences were consistent with the recovery of exclosed streams and riparian areas from impacts caused by livestock grazing. Ungrazed areas consistently had greater canopy shading, stream depths, and bank-full heights and smaller stream widths than grazed areas. California golden trout were very abundant in the study sites; their densities and biomasses were among the highest ever recorded for stream-dwelling trout in the western United States. California golden trout density and biomass per unit area were significantly higher in ungrazed than in grazed areas in three of four comparisons. Differences between grazed and ungrazed areas were less consistent when density and biomass were calculated on the basis of stream length. Our results suggest that current levels of livestock grazing are degrading the stream and riparian components of the study meadows to the detriment of golden trout populations.

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721. Livestock grazing interactions with sage grouse.

Klebenow, D. A.

In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 113-123; 1982.

NAL Call #: SF84.84.W5 1981

Descriptors: Nevada

This citation is from AGRICOLA.

722. Livestock grazing relationships with fisheries.

Burton, T. A. and Kozel, S. J.

In: Proceedings of a symposium on sustaining rangeland ecosystems. (Held 29 Aug 1994-31 Aug 1994 at Eastern Oregon State College, La Grande, Oregon.) Edge, W. D. and Olsen-Edge, S. L. (eds.); Vol. Special Report 953. Corvallis, Ore.: Oregon State University Extension Service; pp. 140-145; 1996.

NAL Call #: 100 Or3M no.953

Descriptors: forest ecology/ forest management/ water quality/ grassland management/ riparian forests/ riparian vegetation/ grasslands/ riparian grasslands/ management/ environmental degradation/ erosion/ grazing/ grazing intensity/ fisheries/ vegetation types

Abstract: The importance of appropriate management of riparian grasslands for maintaining the quality of aquatic habitats is emphasized. Recent estimates for W. USA have indicated that 66% of Bureau of Land Management riparian areas are not functioning properly or are functioning at risk and that 22% of US Forest Service riparian areas are not meeting forest plant objectives for proper condition. Grazing management may have a major effect on aquatic ecosystems. In the Bear Valley Basin, Idaho, use of early-season low intensity grazing by cattle reversed the downward trend in stream bank stability and substrate sedimentation, increasing the survival of the endangered chinook salmon (*Oncorhynchus tshawytscha*).

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723. Livestock impacts on the herbaceous components of sage grouse habitat: A review.

Hockett, Glenn A.

Intermountain Journal of Sciences 8(2): 105-114. (2002); ISSN: 1081-3519

Descriptors: animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ documentation/ publications/ habitat/ terrestrial habitat/ *Centrocercus urophasianus* (Phasianidae): farming and agriculture/ livestock impacts on herbaceous components of sagebrush habitat/ review and management implications/ habitat management/ literature review/ grassland/ scrub/ sagebrush habitat/ Phasianidae/ Galliformes/ Aves/ birds/ chordates/ vertebrates

Abstract: Sage grouse are a bird of climax vegetation. Productive sage grouse habitat is more than a "sea of sagebrush." The grass/forb understory supplies food and cover components seasonally. Within the sagebrush community, a dense, residual herbaceous understory increases the likelihood of sage grouse nest success. Forbs and insects are essential foods for sage grouse from early spring to early fall. Although riparian areas typically make up less than 2 percent of the sagebrush landscape, interspersed springs, streams, and meadows offer watering and feeding sites for sage grouse during summer and early

fall. Livestock selectively remove grasses and forbs within the sagebrush landscape while showing a strong preference for riparian meadows once upland vegetation cures. Livestock use can impact the amount and composition of herbaceous understory depending on the class of livestock, season of use, and grazing intensity. I reviewed the literature regarding sage grouse habitat and livestock impacts to the herbaceous understory. Ungrazed comparison areas, based on the seasonal needs of sage grouse, are lacking. Controls are recommended to advance our understanding of grazing impacts.

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724. Livestock management and productivity of willow flycatches in the central Sierra Nevada.

Valentine, B. E.; Roberts, T. A.; Boland, S. P.; and Woodman, A. P.

Transactions of the Western Section of the Wildlife Society 24: 105-114. (1988)

NAL Call #: SK351.W523; ISSN: 0893-214X

Descriptors: Passeriformes/ wildlife management/ animal husbandry/ wildlife-livestock relations/ grazing/ California
This citation is from AGRICOLA.

725. Macroinvertebrate assemblage change in a small eastern Oregon stream following disturbance by grazing cattle.

Reed, T.

Journal of Freshwater Ecology 18(2): 315-320. (2003)

NAL Call #: QH541.5.F7J68; ISSN: 0270-5060

Descriptors: zoobenthos/ macrofauna/ grazing/ sampling/ ecosystem disturbance/ aquatic insects/ community composition/ population structure/ rivers/ biotic factors/ herbivores/ Chironomidae/ Ephemeroptera/ USA, Oregon/ cattle/ midges/ mayflies

Abstract: Badger Creek (Ochoco National Forest, Oregon) was sampled before and after cattle arrived and on July 31 in a reach of stream where cattle were present and a reach where they were not. Index values and ordination of these samples indicates that seasonality and local conditions are important drivers in macroinvertebrate community composition. In both a three month survey and the single date sampling, disturbance by grazing cattle was correlated with more Chironomidae larvae and fewer mayflies, indicating that cattle create an environment conducive to the macroinvertebrate assemblage compositions found in low oxygen, organically enriched systems.

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726. Macroinvertebrate response to cattail management at Cheyenne Bottoms, Kansas, USA.

Kostecke, R. M.; Smith, L. M.; and Hands, H. M.

Wetlands 25(3): 758-763. (2005)

NAL Call #: QH75.A1W47; ISSN: 0277-5212

Descriptors: recruitment/ biomass/ wetlands/ head/ hydrology/ food/ basins/ typha/ chironomidae

Abstract: Cheyenne Bottoms, Kansas, USA has been designated by the Ramsar convention as a Wetland of International Importance. However, since that 1988 designation, cattail (*Typha* spp.) has become the dominant plant within the basin, and migratory bird use has decreased. We examined the effects of different cattail-management treatments (burned, disked, and grazed by 5 and 20 head of cattle) on macroinvertebrates used as food resources by migratory birds. We found few differences in

diversity, biomass, or density of macroinvertebrates among treatments. When differences existed, diversity, biomass, and density were greater within the control or more heavily vegetated treatments (e.g., burned) than within less vegetated treatments (e.g., disked). Macroinvertebrate densities, particularly Chironomidae, ranged from 154 to 681/m super(2); however, they were up to seven times lower than historic densities and well below the 5000/m super(2) that has been suggested for supporting large numbers (0.5 million) of migratory waterbirds. Thus, Cheyenne Bottoms' capacity to support migratory waterbirds may currently be reduced due to low macroinvertebrate densities in areas where cattail has invaded, as well as in areas where cattail has been managed. Research and management should be targeted at restoring the hydrology and dependent biotic communities that support migratory birds.

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727. Management of livestock to improve and maintain prairie chicken habitat on the Sheyenne National Grasslands.

Eng, R. L.; Toepfer, J. E.; and Newell, J. A.
In: *Prairie chickens on the Sheyenne National Grasslands.* (Held 18 Sep 1987 at Crookston, Minn.)

Bjugstad, Ardell J. (ed.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, US Department of Agriculture, Forest Service; pp. 55-57; 1988.

Notes: ISSN: 0277-5786

NAL Call #: aSD11.A42

Descriptors: birds/ wildlife/ grasslands/ grazing/ range management/ North Dakota

This citation is from AGRICOLA.

728. Managing livestock grazing for mule deer (Odocoileus hemionus) on winter range in the Great Basin.

Austin, Dennis D.

Western North American Naturalist 60(2): 198-203. (2000)

NAL Call #: QH1 .G7; ISSN: 1527-0904

Descriptors: environmental management/ livestock grazing effects/ winter range habitat

Abstract: History and technical literature describing potential effects of livestock grazing on mule deer (*Odocoileus hemionus*) populations and winter range habitat are reviewed. Recommendations for livestock grazing on winter ranges within the Great Basin are advanced.

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729. Mule deer fawn survival on cattle-grazed and ungrazed desert ranges.

Horejsi, R. G., 1982. 47 p. Arizona Game and Fish Department Wildlife Bulletin.

Notes: ISSN: 0518-5467

Descriptors: cattle/ coyote/ deer, mule/ deserts/ female/ food habits/ grazing/ interspecies relationships/ population density/ predation/ production/ rodents/ shrubs/ survival/ trees/ vegetation/ North America/ United States/ Arizona/ Central Region/ Tonto Basin

Abstract: Study areas were the Three Bar Wildlife Area (closed to grazing in 1947) and the Tonto Basin Study Area (under National Forest cattle grazing permit). Data were collected on: rodent and rabbit populations; cover, density

and frequency of trees, shrubs, and half shrubs; fruit, nut, berry, and spring mean forage production; nutritional quality of key forage species; deer population densities; buck(doe)fawn ration in mid-winter; predator populations; coyote, deer, and cattle food habits; and vegetation mapping of TBWA.

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730. Nest sites of ducks in grazed mixed-grass prairie in North Dakota.

Duebbert, H. F.; Lokemoen, J. T.; and Sharp, D. E.

Prairie Naturalist 18(2): 99-108. (1986)

NAL Call #: QH540 .P7; ISSN: 0091-0376

Descriptors: *Symphoricarpos occidentalis*/ *Anas platyrhynchos*/ *Anas strepera*/ *Rosa woodsii*/ *Anas discors*/ *Anas clypeata*/ *Stipa viridula*/ *Agropyron smithii*/ habitat use/ nesting success/ seasonal wetland/ grazing pressure management

Abstract: Habitat use and nesting success of seven species of dabbling ducks were evaluated in five vegetative associations within grazed mixed-grass prairie in central North Dakota. During 1976-80, 548 nests were found on 412 ha of grazed prairie for an annual average density of 27 nests/100 ha. Numbers of nests found ranged from 1/100 ha in 1977 (a drought year) to 58/100 ha in 1979 (a very wet year), reflecting the variability that may be expected in a dynamic prairie wetland environment. Nesting success ranged from an average of 23% in the western snowberry (*Symphoricarpos occidentalis*) association to 34% in the mixed-grass association. Forty-two percent of the mallard (*Anas platyrhynchos*) nests and 35% of the gadwall (*A. strepera*) nests were in patches of western snowberry and/or Wood's rose (*Rosa woodsii*) that made up 2% of the available cover. Numbers of nests of blue-winged teal (*A. discors*) and northern shoveler (*A. clypeata*) were highest in cool-season grasses, especially green needlegrass (*Stipa viridula*) and western wheatgrass (*Agropyron smithii*). Height/density (HD) of residual cover decreased exponentially with increased grazing pressure. Use of grazed prairie by blue-winged teal was maximized when the HD of residual cover was 0.5 dm or higher, as could be maintained under light grazing. Results of this study indicated that properly grazed mixed-grass prairie can provide adequate nesting habitat for dabbling ducks. We recommend that preservation and sound ecological management be focused on large tracts of mixed-grass prairie with complexes of seasonal and semipermanent wetlands.

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731. Nest success of ducks on rotational and season-long grazing systems in Saskatchewan.

Ignatiuk, Jordan B. and Duncan, David C.

Wildlife Society Bulletin 29(1): 211-217. (2001)

NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: grazing system: rotational, season long/ nest success/ nest survival/ residual vegetation cover

Abstract: Rotational grazing systems have been implemented to increase duck production in the prairie pothole region, although evidence to support the contention of increased duck production is scant at best. We examined duck nest success on 12 once-over rotational grazing systems and 12 season-long pastures in southern Saskatchewan. Analysis of 617 nests from 23 pastures failed to reveal a difference in nest survival between

rotational and season-long grazing systems (20.2% versus 25.1%), although there was a year X treatment effect interaction wherein nest success differed between years on rotational pastures but not on season-long pastures. Residual vegetation cover from randomly clipped plots did not differ between grazing treatments but did differ between years. Nest success on pastures within years was not related to vegetative carryover. Although we did not detect greater duck nest success on rotational grazing systems compared to season-long pastures, rotational systems could be beneficial if they preserve or improve grassland areas, attract more ducks from less productive habitats, or increase duckling survival. Our study provides strong additional evidence of the high nest success on pastures compared to most other habitat types, including small plots of planted cover. Converting cropland to pastures and retaining existing pastures are recommended to maintain and improve duck production in the prairie pothole region.
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732. Nesting success of upland nesting waterfowl and sharp-tailed grouse in specialized grazing systems in southcentral North Dakota.

Sedivec, K. K.; Messmer, T. A.; Barker, W. T.; Higgins, K. F.; and Hertel, D. R.
In: Can livestock be used as a tool to enhance wildlife habitat? (Held 13 Feb 1990 at Reno, Nev.)
Severson, Kieth E. (eds.)
Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, US Department of Agriculture, Forest Service; pp. 71-92; 1990.
Notes: 43rd Annual Meeting of the Society for Range Management
NAL Call #: aSD11.A42 no.194
Descriptors: animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ reproduction/ ecology/ population dynamics/ land and freshwater zones/ Nearctic Region/ North America/ USA/ Anas/ Aythya (Anatidae)/ Tympanuchus phasianellus (Phasianidae): farming and agriculture/ livestock grazing systems effects on nesting success/ habitat management/ livestock grazing system recommendations for increasing nesting success/ reproductive productivity/ population density/ nesting density/ North Dakota/ south central/ nesting success/ effects of livestock grazing systems/ Anatidae/ Anseriformes/ Aves/ birds/ chordates/ vertebrates
© The Thomson Corporation

733. Nongame wildlife communities in grazed and ungrazed montane riparian sites.

Schulz, T. T. and Leininger, W. C.
Great Basin Naturalist 51(3): 286-292. (1991)
NAL Call #: 410 G79; ISSN: 0017-3614
Descriptors: Zapus princeps/ bird/ small mammal/ Wilson's warbler/ western jumping mouse/ cattle grazing/ wildlife management/ Rocky Mountains/ Colorado/ USA
© The Thomson Corporation

734. Observations of pronghorn distribution in relation to sheep grazing on the Desert Experimental Range.

Clary, W. P. and Holmgren, R. C.
In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.)

Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 581-592; 1982.
NAL Call #: SF84.84.W5 1981
Descriptors: Utah
This citation is from AGRICOLA.

735. Observations of white-tailed deer and cattle diets in Mexico.

Martinez M, Alfonso; Molina, Victor; Gonzalez S. Fernando; Marroquin, Jorge S.; and Navar Ch, Jesus
Journal of Range Management 50(3): 253-257. (1997)
NAL Call #: 60.18 J82; ISSN: 0022-409X
http://jrm.library.arizona.edu/data/1997/503/253-257_martinez.pdf
Descriptors: nutrition/ diet/ feeding behaviour/ ecology/ competition/ habitat/ terrestrial habitat/ man made habitat/ land and freshwater zones/ Nearctic Region/ North America/ Odocoileus virginianus texanus (Cervidae): food plants/ food preferences/ interspecific competition/ Bos indicus and B. taurus (Mammalia) grazing resources/ dietary structure and selectivity implications/ rangeland/ grassland/ rangeland pasture/ cultivated land habitat/ pasture/ Mexico/ Nuevo Leon/ anahuac/ dietary composition and sympatric species overlap/ faecal analysis/ Cervidae/ Artiodactyla/ Mammalia/ chordates/ mammals/ vertebrates
© The Thomson Corporation

736. Observations on white-tailed deer and habitat response to livestock grazing in south Texas.

Cohen, W. E.; Drawe, D. L.; Bryant, F. C.; and Bradley, L. C.
Journal of Range Management 42(5): 361-365. (1989)
NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1989/425/2cohe.pdf>
Descriptors: Odocoileus virginianus/ rotational grazing/ Texas
Abstract: Since short duration grazing (SDG) was introduced to Texas, concern for white-tailed deer (Odocoileus virginianus) has magnified because they are a species of major economic importance to ranchers. The objective of this study was to observe the effects of SDG and continuous yearlong grazing (CG) on home ranges and movement indices of female deer, and on forage availability. The study was conducted on the Rob and Bessie Welder Wildlife Refuge, near Sinton, Texas. The study area included a 10-pasture SDG cell and a CG pasture, each stocked at 2.8 ha/auy. Cattle grazed each SDG paddock 2 to 8 days; paddocks were rested 32 to 47 days. A total of 3,961 radio-fixes from 11 does was collected over an 11-month study period in 1983. Monthly and annual home ranges of does were similar ($P > 0.05$) between SDG (207 ha) and CG (229 ha). However, white-tailed deer traveled 35% more ($P < 0.05$) between fixes in SDG (449 m) than in CG (332 m) from May to August, a time of greatest physiological and nutritional stress for female deer in south Texas. Also, does avoided ($P < 0.05$) cattle during 2 cycles of the SDG rotation. The primary trend observed was for the deer under SDG to avoid cattle concentrations by alternating between preferred habitats rather than a predictable paddock-to-paddock movement. In general, there were few differences in total grass and

forb cover between SDG and CG. However, several forage species important to deer were less frequent ($P < 0.05$) under SDG than CG.

This citation is from AGRICOLA.

737. Odonates as biological indicators of grazing effects on Canadian prairie wetlands.

Foote, Alee and Hornung, Christine L. Rice
Ecological Entomology 30(3): 273-283. (2005)

NAL Call #: QL461 .E4; ISSN: 0307-6946

Descriptors: wetlands/ grazing/ vegetation/ prairies/ abundance/ indicator species/ reproductive effort/ water quality/ biodiversity/ agriculture/ aquatic insects/ emergent vegetation/ lentic environment/ ecosystem disturbance/ *Scirpus acutus*/ *Zygoptera*/ *Odonata*/ Canada, Alberta/ damselflies/ dragonflies

Abstract: 1. Aquatic macro-invertebrates have frequently been used as biological indicators in lotic environments but much less commonly so in lentic habitats. Dragonflies and damselflies (Order Odonata) satisfy most selection criteria for lentic bioindicators of grazing impacts. 2. Intensive cattle grazing affects most of the Canadian prairie pothole region but the effects of grazing on wetlands are poorly understood. 3. Here the vegetation structure and invertebrate community composition of 27 prairie potholes in Alberta, Canada were studied and compared. Wetlands were evenly divided into three treatments of different grazing regimes. 4. Removal of emergent vegetation by cattle grazing decreased odonate abundance and reproductive effort. Shorter *Scirpus acutus* stems resulted in significantly fewer damselflies (Suborder Zygoptera) and lower reproductive efforts. 5. Overall odonate diversity was affected by the height of key plant species, highlighting the importance of the vegetation structure of both emergent vegetation for breeding and adjacent upland vegetation for nocturnal roosts. Wetland vegetation structure was more important than vegetation composition to the life history of odonates. 6. Wetland water quality parameters of nitrogen, phosphorus, total dissolved solids (TDS), and chlorophyll-a concentration did not change due to the presence of grazing cattle at wetlands so water quality influences were rejected as mechanisms of change. 7. Larval odonate diversity and abundance was positively correlated with overall aquatic macro-invertebrate diversity and abundance, hence it was concluded that the larval odonate community can be an accurate bioindicator of intactness and diversity of overall aquatic macro-invertebrate communities in Canadian prairie wetlands.

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738. Potential uses of cattle grazing to manage waterfowl nesting cover on Turnbull National Wildlife Refuge.

Rees, J. R.

In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 86-93; 1982.

NAL Call #: SF84.84.W5 1981

Descriptors: Washington

This citation is from AGRICOLA.

739. Practices for livestock grazing and aquatic habitat protection on Western rangelands.

May, B. E. and Davis, B.

In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 271-278; 1982.

NAL Call #: SF84.84.W5 1981

740. Predicting the impact of livestock grazing on birds using foraging height data.

Martin, Tara G. and Possingham, Hugh P.

Journal of Applied Ecology 42(2): 400-408. (2005)

NAL Call #: 410 J828; ISSN: 0021-8901

Descriptors: species diversity/ habitat structure/ livestock grazing/ foraging height data

Abstract: 1. Habitat structure is a major determinant of bird species diversity. One process by which habitat structure is altered is livestock grazing, the most extensive land use across most continents. While the impacts of grazing on vegetation have received much attention, the effects on avifauna are less well known. 2. Predictions of the impact of grazing on Australian woodland and riparian bird assemblages were formulated. We used available information on the vegetation strata utilized by each species for foraging and the strata most affected by grazing. 3. We compared predictions based on foraging height preferences with differences in bird density in grassy eucalypt woodland and riparian habitats subject to three levels of grazing. We found that foraging height preference was a good predictor of species' susceptibility to grazing. Birds exhibited both monotonic and non-monotonic responses to grazing, with the majority of bird species declining with increasing grazing pressure. 4. Synthesis and applications. Existing information on foraging behaviour can be used to make predictions of the impact of any threat on birds where that threat alters habitat structure. While the approach is simple, it is a point of departure for more complex predictive models, and avoids the circularity of post hoc interpretation of impact data. This approach can be used to guide management decisions where landscapes are in a state of transition and species conservation is a priority.

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741. Preliminary evaluation of elk habitat use within a three-pasture rest-rotation grazing system.

Frisina, M. R.

Proceedings of the Montana Academy of Sciences 46: 27-36. (1986)

NAL Call #: 500 M762

Descriptors: *Cervus elaphus canadensis*/ grazing/ habitats/ livestock/ range management/ resource management/ rotational grazing/ wildlife management/ plant protection/ wildlife-livestock relations/ Montana

This citation is from AGRICOLA.

742. A preliminary report on the effects of a deferred-rotation grazing system on wildlife at the Sheldon National Wildlife Refuge.

Oldemeyer, J. L.; Martin, S. J.; and Woodis, S. G.

Cal-Neva Wildlife Transactions: 26-42. (1983)

NAL Call #: SK351.W523; ISSN: 0095-3601

This citation is from AGRICOLA.

743. Prescribed fire and cattle grazing on an elk winter range in Montana.

Jourdonnais, C. S. and Bedunah, D. J.
Wildlife Society Bulletin 18(3): 232-240. (1990)
 NAL Call #: SK357.A1W5; ISSN: 0091-7648
Abstract: Burn and cattle-grazing treatments reduced rough fescue *Festuca scabrella* standing crop, the preferred winter elk *Cervus elaphus* forage, during the initial growing season. By the 2nd growing season, the rough fescue standing crop was similar to the control in all treatments. Cattle grazing maintained more down litter accumulations than the burn treatments, were similar for all treatment in the second and third growing seasons after treatment. Elk use of the study area was limited to late fall, winter, and early spring and was greater in the burn and cattle-grazed treatments compared with the control. Elk use of rough fescue was concentrated on plants without heavy litter. Idaho fescue *F. idahoensis* received significant use by elk only after rough fescue was heavily utilized. Other native species received little or no use. -from Authors
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744. Prescribed sheep grazing to enhance wildlife habitat on North American rangelands.

Mosley, J. C.
Sheep Research Journal Special Issue: 79-91. (1994)
 NAL Call #: SF371.R47; ISSN: 1057-1809
Descriptors: sheep/ grazing/ species diversity/ botanical composition/ habitats/ wildlife management/ *Ovis canadensis*/ plant litter
 This citation is from AGRICOLA.

745. Pronghorn reactions to winter sheep grazing, plant communities, and topography in the Great Basin.

Clary, W. P. and Beale, D. M.
Journal of Range Management 36(6): 749-752. (1983)
 NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1983/366/18clar.pdf>
Descriptors: Utah
 This citation is from AGRICOLA.

746. Reproductive success and brood survival of bobwhite quail as affected by grazing practices.

Cantu, R. and Everett, D. D.
 In: Proceedings, Second National Bobwhite Quail Symposium. Schitoskey, F.; Schitoskey, E. C.; and Talent, L. G. (eds.)
 Stillwater, Okla.: Oklahoma State University;
 pp. 79-83; 1982.
 NAL Call #: QL696.G27N3 1982
Descriptors: Texas
 This citation is from AGRICOLA.

747. Response of bobwhites to cover changes within three grazing systems.

Hammerquist-Wilson, M. M. and Crawford, J. A.
Journal of Range Management 34(3): 213-215. (1981)
 NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1981/343/11hamm.pdf>
Descriptors: Texas
 This citation is from AGRICOLA.

748. The response of small mammal communities to cattle grazing on a coastal meadow.

Schmidt, Niels M. and Olsen, Henrik
Polish Journal of Ecology 51(1): 79-84. (2003)
 NAL Call #: 512 W263; ISSN: 1505-2249
Descriptors: animals and man/ disturbance by man/ commercial activities/ ecology/ habitat/ terrestrial habitat/ land and freshwater zones/ Palaearctic Region/ Europe/ Mammalia: farming and agriculture/ cattle grazing intensity/ community structure effects/ community structure/ grassland/ coastal meadow/ Denmark/ western amager/ Klydeso Bird Reserve/ cattle grazing intensity effects/ small taxa/ Mammalia/ chordates/ mammals/ vertebrates
Abstract: The response of small mammals to cattle grazing on a coastal meadow with three different grazing intensities was evaluated. Grazed areas tended to hold fewer small mammals than the ungrazed control area, though the variation was high. The negative effect of grazing increased with grazing intensity. Small mammals were caught almost exclusively in patches of high, dense vegetation, and it is suggested that the negative effect of grazing results from the reduced number of such patches. Grazing also affected small mammal species richness, where richness was generally lower in the area of high grazing intensity than in areas with low grazing intensity or without grazing.
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749. Response of small mammals to livestock grazing in southcentral Idaho.

Johnson, M. K.
Journal of Range Management 35(1): 51-53. (1982)
 NAL Call #: 60.18 J82; ISSN: 0022-409X
<http://jrm.library.arizona.edu/data/1982/351/14john.pdf>
Descriptors: Idaho
 This citation is from AGRICOLA.

750. Response of vertebrates to fenceline contrasts in grazing intensity in semi-arid woodlands of eastern Australia.

James, Craig D.
Austral Ecology 28(2): 137-151. (2003)
 NAL Call #: QH540 .A8; ISSN: 1442-9985
Descriptors: assemblage composition/ fauna change/ fenceline contrasts/ grazing intensity/ ground cover/ pastoral industry/ semi arid woodland/ species abundance/ species richness/ vertebrate response/ water source introduction
Abstract: Changes in the abundance, species richness and assemblage composition of vertebrates due to grazing by domestic stock were investigated in the semi-arid woodlands of eastern Australia. Analyses were based on the differences found at 10 fenceline contrast sites. Two species of amphibians, 22 species of reptiles and two species of small mammal were captured in pit traps during the surveys. Kangaroos (red and eastern grey), sheep, goats and 66 species of birds were recorded along line transects. Analyses revealed that abundance of diurnal reptiles and species richness of diurnal reptiles and birds were significantly lower on heavily grazed sites than they were on lightly grazed sites. At a local scale, the gecko, *Gehyra variegata*, was more abundant where grazing was heavier, while *Diplodactylus conspicillatus*, *Diplodactylus steindachneri* and *Rhynchoedura ornata* responded to variables indirectly related to grazing intensity (kangaroo density, sheep and goat dung mass and sheep density,

respectively). Birds more commonly sighted on lightly grazed areas than heavily grazed areas were the apostlebird, brown treecreeper, crested bellbird, grey butcherbird, hooded robin, jacky winter, little woodswallow, Australian magpie-lark, mulga parrot, splendid wren, white-browed treecreeper and yellow-rumped thornbill. Birds more commonly sighted on heavily grazed areas than on lightly grazed areas were the Australian raven and chestnut-crowned babbler. Most variation in species composition between sites was due to spatial separation and no regional-level indicator species of grazing were evident. A combination of direct grazing-related changes (e.g. loss of ground cover) and indirect effects of the pastoral industry (e.g. introduction of artificial sources of water) lead to changes in fauna at different scales of analysis across regions.

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751. Response of winter birds to drought and short-duration grazing in southeastern Arizona.

Bock, Carl E. and Bock, Jane H.

Conservation Biology 13(5): 1117-1123. (1999)

NAL Call #: QH75.A1C5; ISSN: 0888-8892

Descriptors: canopy cover/ cattle ranch/ drought/ grassland oak savanna/ grazing/ livestock exclosure/ short duration grazing/ species abundance/ vegetative ground cover

Abstract: In a grassland-oak savanna in southeastern Arizona, we compared vegetative ground cover and bird populations between a 29-year livestock exclosure and an adjacent cattle ranch that was managed according to the principles of holistic resource management, including short-duration rotational grazing. The study took place in the winter after a 2-year drought and 1 year after the drought ended and stocking densities were reduced. During the first winter, grasses on the livestock exclosure were taller (4.4 times) and had higher basal area ground cover (2.5 times), canopy cover (2.2 times), and reproductive canopy cover (10 times) than in the grazed area. These differences persisted into the second winter but at lower levels. As a group, 19 species of ground-foraging, seed-eating birds (e.g., doves, quail, sparrows, towhees) were 2.7 times more abundant on the exclosure than on adjacent grazed grasslands during the first winter. These same species were 1.7 times more abundant on the exclosure during the second winter and were 2.9 times more abundant on both sites combined after the drought had ended. A second group of 24 avian species with different foraging ecologies (e.g., predators, frugivores, arboreal insectivores) did not differ between treatments or years. High-density, short-duration rotational grazing, coupled with a drought, left the land in a substantially denuded condition through two winters and negatively affected a variety of resident and migratory birds dependent on ground cover and seed production for over-winter survival.

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752. Responses of bobwhite to short duration and continuous grazing in south Texas.

Bareiss, Laura J.

Texas Tech University, 1985.

Descriptors: *Colinus virginianus*/ food supply/ habitat disturbance/ interspecific relations/ land use/ livestock/ mortality/ Texas

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753. Responses of grasshopper assemblages to long-term grazing management in a semi-arid African savanna.

Gebeyehu, Solomon and Samways, Michael J.

Agriculture, Ecosystems & Environment 95(2-3): 613-622. (2003)

NAL Call #: S601 .A34; ISSN: 0167-8809

Descriptors: continuous grazing: applied and field techniques/ long term grazing management: applied and field techniques/ rotational grazing: applied and field techniques/ seasonal grazing: applied and field techniques/ bare ground gradients/ continuous resting/ continuously grazed sites/ environmental variables/ rotationally grazed sites/ semi arid savanna/ shrub cover gradients/ soil temperature gradients/ vegetation density

Abstract: A study on grasshopper assemblage response to seasonal grazing, rotational grazing, continuous resting and continuous grazing was undertaken in the eastern Karoo, South Africa. Rotationally-grazed sites supported the highest number and abundance of grasshopper species while continuously-grazed sites had the lowest. Spring-grazed and winter-grazed sites were the most similar, with continuously-rested sites being the next similar to these. Rotationally-grazed sites showed the least similarity to the other sites. There were clear groupings of sites and grasshopper species, with most species associated with rotationally-grazed sites. Continuously-grazed sites had a different grasshopper assemblage. The assemblages followed definite gradients of measured environmental variables. Rotationally-grazed sites occurred along gradients of increasing bare ground, while continuously-grazed and summer-grazed sites occurred along increasing gradients of shrub cover and soil temperature. Spring-grazed, autumn-grazed, winter-grazed and rotationally-grazed sites were characterized by high vegetation density. Grasshopper dominance differed between sites. Summer-grazed sites had high dominance of *Pseudodictya flavipes* (40%), winter-grazed sites of *Pseudodictya* sp. (32%). The significance of variable grazing management systems for maintaining floral and grasshopper diversity is discussed. Rotational grazing in this arid system is most suited to maintaining plant and insect diversity.

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754. Responses of raptors to livestock grazing in the western USA.

Kochert, M. N.

In: Proceedings of the Western Raptor Management Symposium and Workshop. (Held 26 Oct 1987-28 Oct 1987 at Boise, Idaho, USA.) Pendleton, B. G. (eds.)

Washington, D.C., USA: Institute for Wildlife Research and National Wildlife Federation; pp. 194-203; 317 p.; 1989.

Notes: ISSN: 1044-4971

NAL Call #: QL696.F3W47 1989; ISBN: 0945051026

Descriptors: review/ mammal/ grazing system/ plant population change/ habitat destruction/ nesting/ prey availability/ diversity/ population/ conservation

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755. Restoring wetland habitats with cows and other livestock: A prescribed grazing program to conserve bog turtle habitat in New Jersey.

Tesauro, J.

Conservation Biology in Practice 2(2): 26-30. (2001); ISSN: 1526-4629.

Notes: Publication URL: <http://www.conbio.org/CIP/>

Descriptors: Bos taurus/ reptiles/ cattle/ wetland/ habitat management/ agriculture/ USA/ New Jersey

© NISC

756. Reverting Conservation Reserve Program lands to wheat and livestock production: Effects on ground beetle (Coleoptera: Carabidae) assemblages.

French, B. Wade; Elliott, Norman C.; and Berberet, Richard C.

Environmental Entomology 27(6): 1323-1335. (1998)

NAL Call #: QL461.E532; ISSN: 0046-225X

Descriptors: agricultural lands/ grazing lands/ Conservation Reserve Program

Abstract: Highly erodible lands enrolled in the Conservation Reserve Program soon will revert to agricultural production. This study was designed to determine the effects of reversion of Conservation Reserve Program lands to wheat and livestock production on ground beetle assemblages. Reversion strategies included no reversion of Conservation Reserve Program grass (unmanaged bluestem), simulated grazing of Conservation Reserve Program grass (managed bluestem), minimum-tillage practices for wheat production, and no-tillage practices for wheat production. A randomized block experimental design was established with 4 replicates. More ground beetles were captured in pitfall traps in 1995 than in 1996, and abundances within years differed among reversion strategies. Of the 73 ground beetle species collected, 9 species accounted for 61.7% of total abundance. Abundances of these 9 species differed with respect to reversion strategy. Species diversity and evenness differed among the reversion strategies in 1995, but only evenness differed in 1996. Canonical correspondence analysis showed that annual and monthly variation were the predominant factors in separating ground beetle assemblages. Lack of rainfall may have accounted for a large portion of differences in abundances between years. A partial canonical correspondence analysis showed that simulated grazing and no-tillage wheat were the predominant reversion strategies in separating ground beetle assemblages. These treatments represent disturbance levels intermediate to unmanaged bluestem and minimum-tillage wheat.

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757. Riparian fencing, grazing, and trout habitat preference on Summit Creek, Idaho.

Keller, C. R. and Burnham, K. P.

North American Journal of Fisheries Management 2(1): 53-59. (1982)

NAL Call #: SH219.N66; ISSN: 0275-5947

Descriptors: grazing/ control/ abundance/ land use/ watersheds/ body size/ habitat selection/ electric fishing/ salmonidae/ Salvelinus fontinalis/ effects on/ riparian environments/ fencing/ electric fishing/ Salmo gairdneri/ USA, Idaho, Summit Creek

Abstract: In 1975, 3.2 km of Summit Creek, Idaho were fenced by the Bureau of Land Management to exclude

livestock from the riparian area. Six stream sections were electrofished in 1979 to determine differences in trout abundance, size, and growth between grazed and ungrazed stream sections. Electrofishing stations were paired by habitat type. There were more trout in ungrazed sections than in grazed sections in all three habitat types sampled. With one exception, there were more catchable-sized (200 mm long or longer) rainbow trout (*Salmo gairdneri*) and brook trout (*Salvelinus fontinalis*) in the ungrazed area than in the grazed area. There was also evidence that the average size of the fish was less in grazed sections. Fish population data were not collected prior to fencing; therefore it cannot be firmly concluded that the trout population increased within the livestock enclosure as a result of fencing the riparian area. However, the combined results of previous trout habitat improvements documented for Summit Creek, as a result of the fencing, and this study support the conclusion that trout prefer stream areas in ungrazed habitat over grazed habitat.

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758. Rodent communities in a grazed and ungrazed Arizona grassland, and a model of habitat relationships among rodents in southwestern grass/shrublands.

Jones, Zach F.; Bock, Carl E.; and Bock, Jane H.

American Midland Naturalist 149(2): 384-394. (2003)

NAL Call #: 410 M58; ISSN: 0003-0031

Descriptors: *Baiomys taylori*/ *Reithrodontomys fulvescens*/ *Reithrodontomys megalotis*/ *Sigmodon flaviventris*/ *Cricetidae*/ *Rodentia*/ *Chaetodipus hispidus*/ *Dipodomys merriami*/ *Perognathus flavus*/ *Heteromyidae*/ *Muridae*

Abstract: We live-trapped rodents in 2000-2001 at eight sites on a 3160 ha grassland and mesquite-oak savanna in southeastern Arizona that had been ungrazed since 1968, and on eight paired sites on adjacent cattle ranches. There were 917 captures of 14 species during 5760 trap-nights. Four species of *Muridae* (*Sigmodon flaviventris*, *Baiomys taylori*, *Reithrodontomys megalotis* and *R. fulvescens*) were significantly more common on ungrazed plots, while no species was more abundant on grazed plots. However, *Heteromyidae* as a group (especially *Chaetodipus hispidus* and *Perognathus flavus*) comprised a significantly higher proportion of total captures on grazed plots, and heteromyids as a percentage of total captures was positively correlated across all plots with amount of bare ground. One of the eight cross-fence sites also had been trapped in 1981-1983. In the 17 y between trapping events at this site: (1) the grass canopy on both grazed and ungrazed plots had become dominated by taller species, (2) a kangaroo rat (*Dipodomys merriami*) that had been the second most common species in grazed areas disappeared from both plots, (3) pocket mice increased on the grazed plot and declined on the ungrazed plot and (4) *Muridae* (excluding *Peromyscus*) as a percent of all captures increased by greater than 1.5-fold on both plots. Based on these results, and those from other field studies, we propose a model for the composition of rodent communities in grass/shrublands of the Southwest and Intermountain West, based on ground cover. Kangaroo rats (*Dipodomys* spp.) are abundant in areas with the most bare soil, *Muridae* (specifically, *Sigmodon*, *Baiomys* and *Reithrodontomys*) dominate areas with the most and tallest ground cover, and pocket mice (*Chaetodipus* and *Perognathus*) are common in areas of intermediate cover. In relatively mesic grasslands, livestock grazing and fire

drive the rodent community toward one dominated by heteromyids instead of murids. In more arid landscapes, grazing and fire favor kangaroo rats over pocket mice.
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759. Rotational management of grasslands and invertebrate diversity.

Morris, M. G. and Rispin, W. E.
In: Grassland management and nature conservation: Proceedings of a joint meeting between the British Grassland Society and the British Ecological Society. (Held 27 Sep 1993-29 Sep 1993 at Leeds University, UK.); pp. 205-209; 1994.

NAL Call #: SB197.B7 no.28

Descriptors: nature reserves/ grassland management/ grazing systems/ rotational grazing/ grasslands/ chalk grasslands/ species diversity/ plant height/ management/ aspect/ nature conservation

Abstract: Invertebrates were sampled from 1982 until 1985 in a rotational sheep-grazing trial on chalk grassland at Old Winchester Hill National Nature Reserve. Details of Heteroptera and Auchenorrhyncha caught are given. Differences between years, between plots and between positions on the S.-facing hillside were important as were differences in the sward due to grazing treatment. The abundance of many invertebrate species was positively correlated with vegetation height. The study confirmed much previous work which shows that tall grassland is important for the conservation of insects. The rotational system allowed several structural types of grassland to be maintained for a range of plants and animals at one site and is recommended to maintain insect diversity.

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760. Rough-legged hawk habitat selection in relation to livestock grazing on Malheur National Wildlife Refuge, Oregon.

Littlefield, Carroll D.; Thompson, Steven P.; and Johnstone, Richard S.

Northwestern Naturalist 73(3): 80-84. (1992)

NAL Call #: QL671.M8; ISSN: 1051-1733

Descriptors: Accipitridae/ Ciconiiformes/ Buteo lagopus/ birds/ behavior/ grazing/ habitat use/ habitat alterations/ mowing/ overwintering/ wildlife/ livestock relationships

© NISC

761. The selection of grazing marshes by breeding birds.

Peel, S.; Milsom, T. P.; and Langton, S. D.

In: Grassland management in environmentally sensitive areas. (Held 23 Sep 1997-25 Sep 1997 at Lancaster, United Kingdom.) Sheldrick, R. D. (eds.); pp. 144-149; 1997.

NAL Call #: SB197.B7; ISBN: 0905944542

762. Sharp-tailed grouse and range management practices in western rangelands.

Kessler, W. B. and Bosch, R. P.

In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 133-146; 1982.

NAL Call #: SF84.84.W5 1981

763. The shorebirds and waterbirds on some grazed and ungrazed islands on the Finnish west coast.

Ulfvens, J.

Ornis Fennica 68(1): 26-32. (1991)

NAL Call #: 413.8 OR66; ISSN: 0030-5685

Descriptors: breeding population density/ conservation/ topography/ open area/ Finland

Abstract: The study deals with the shore- and waterbirds on 12 low moraine islands (areas 2.0-23.6 ha) on the Finnish east coast. Five of the islands were still grazed during the study year or until very recently, while the other seven were mostly covered with forest. Of the shore- and waterbirds counted, 86% nested on the grazed islands. The density of breeding birds was significantly higher on the grazed islands than on the ungrazed ones, but there was no statistically significant difference in the number of species or pairs. Although many topographic features of the island may influence the composition of the bird fauna, there was a significant correlation between the proportion of open areas (i.e. low grass meadows and areas with scanty bushes) and the density of the shore- and waterbirds. The bird density was 1.5-3.3 pairs/ha on the ungrazed islands (13-26% open areas), and 10.6-74.5 pairs/ha on the grazed islands (28-100% open areas). I suggest that continuation of grazing for keeping at least 40% of the grazed island open would be a practical and cost-effective method of ensuring a fairly rich shore- and water bird fauna.
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764. Shrub-grassland small mammal and vegetation responses to rest from grazing.

Rosenstock, S. S.

Journal of Range Management 49(3): 199-203. (1996)

NAL Call #: 60.18 J82; ISSN: 0022-409X

http://jrm.library.arizona.edu/data/1996/493/199-203_rosenstock.pdf

Descriptors: small mammals/ grazing/ microhabitats/ canopy/ species diversity/ habitats/ grasses/ shrubs/ plant communities/ Utah

Abstract: Between 1989-1991, I studied the effects of livestock grazing on vegetation and small mammals in semiarid shrub-grassland habitats of south-central Utah. Responses were measured at 2 spatial habitat scales; patches and macrohabitats. Patch-scale data were obtained from 4 small (<1 ha) livestock exclosures and nearby grazed areas. Macrohabitat-scale data were collected at 4 actively grazed sites and 4 comparable, excellent condition sites, ungrazed for 30+ years. Ungrazed patch and macrohabitat sites had more surface litter, greater perennial grass cover, and taller perennial grass plants, but treatment response varied among sites. Small mammal responses were apparent only at the macro-habitat scale, where ungrazed sites had 50% greater species richness and 80% higher abundance. Small mammal reproductive activity and biomass were not affected by rest from grazing at either scale. Small mammal community composition varied greatly among sites and within treatments. This variability has important implications for ecological monitoring efforts involving these species. This citation is from AGRICOLA.

765. Simulation of host-parasite-landscape interactions: Influence of season and habitat on cattle fever tick (*Boophilus* sp.) population dynamics in rotational grazing systems.

Teel, P. D.; Marin, S.; Grant, W. E.; and Stuth, J. W. *Ecological Modelling* 97(1-2): 87-97. (1997)
 NAL Call #: QH541.15.M3E25; ISSN: 0304-3800
 Descriptors: cattle fever/ cattle fever tick/ models and simulations/ parasite/ pest management/ population dynamics/ primary/ rotational grazing system/ vector
 Abstract: Explicit consideration of spatial and temporal factors regulating host-parasite-landscape interactions is basic to understanding systems perspectives for the management of animal parasites. A simulation model of cattle fever tick, *Boophilus annulatus* and *B. microplus*, population dynamics on rangelands of the northeastern Mexico-United States border region was modified to examine spatial and temporal dynamics of ticks in rotational grazing systems. Five short-duration grazing rotations in an eight-pasture system were evaluated on rangeland landscapes dominated by uncanopied grass, mesquite canopied grass and mixed-brush canopied grass. Infestations of the grazing system were initiated by introducing infested cattle in either fall or spring. Grazing system infestations in mesquite and mixed brush canopied grass persisted longer than those in uncanopied grass and were characterized by more frequent reinfestations of both pastures and cattle over the two-year simulations. Infestations initiated in fall were generally of longer duration than those initiated in spring due in part to longer incubation periods for tick eggs. Temporal dynamics of infestations by pasture were evaluated numerically and graphically. These analyses show that gaps and discontinuities of infestations within individual pastures over the course of the fall- and spring-initiated simulations reflect host-parasite-landscape interactions affecting tick distribution and survival.

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766. Small mammal populations in a grazed and ungrazed riparian habitat in Nevada.

Medin, D. E. and Clary, W. P. *Research Paper Int - US Department of Agriculture, Forest Service, Intermountain Research Station*(413): 6 p. (Oct. 1989)

NAL Call #: A99.9 F764U; ISSN: 0886-7380
 Descriptors: wildlife/ mammals/ habitats/ *Populus tremuloides*/ *Salix*/ population dynamics/ riparian buffers/ grazing/ Nevada

This citation is from AGRICOLA.

767. Small mammals in tall-grass prairie: Patterns associated with grazing and burning.

Clark, Bryon K.; Kaufman, Donald W.; Finck, Elmer J.; and Kaufman, Glennis A.

Prairie Naturalist 21(4): 177-184. (1989)
 NAL Call #: QH540 .P7; ISSN: 0091-0376

Descriptors: *Blarina hylophaga*/ *Microtus ochrogaster*/ *Peromyscus maniculatus*/ *Peromyscus leucopus*/ ecosystems/ grasslands/ fires/ burns/ grazing/ habitat alterations/ prairies/ wildlife/ livestock relationships/ North America/ United States/ Kansas: Geary County/ Kansas: Riley County

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768. Soil microarthropods as indicators of exposure to environmental stress in Chihuahuan desert rangelands.

Kay, F. R.; Sobhy, H. M.; and Whitford, W. G. *Biology and Fertility of Soils* 28(2): 121-128. (1999)
 NAL Call #: QH84.8.B46; ISSN: 0178-2762

Descriptors: bulldozing/ desert grassland/ desertification/ environmental stress indicators/ grazing/ habitat/ microclimate/ rainfall/ rangeland/ soil communities/ vegetation damage

Abstract: We studied soil microarthropod communities along livestock grazing disturbance gradients, inside and outside grazing exclosures, and on areas subjected to restoration efforts (herbicide and bulldozing) in order to test the suitability of mites as indicators of rangeland soil quality. We found that mite numbers generally increased with decreased grazing disturbance. Soil microarthropods appeared to respond to a complex of factors including soil compaction, depth to an impervious soil layer, below-ground vegetative biomass, and residual effects of herbicide. All of our study plots, except those that had been herbicide treated, were dominated by microbivorous mites of the family Nanorchestidae. The numerical responses of mites, especially nanorchestids, appeared to provide a sensitive indicator of ecosystem health in a Chihuahuan Desert grassland.

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769. Spatial and temporal differences in the abundance of black grouse and other moorland birds in relation to reductions in sheep grazing.

Baines, D.; Warren, P.; and Calladine, J. *Aspects of Applied Biology*(67): 245-252. (2002)

NAL Call #: QH301.A76; ISSN: 0265-1491
 Descriptors: grazing/ moorlands/ spatial variation/ species diversity/ species richness/ temporal variation/ wildlife conservation

Abstract: The effect of agri-environment schemes introduced to promote heather regeneration in moorland habitats on breeding birds was assessed at 12 pairs of sites in northern England. Sheep reductions were associated with increases in "heath" species and cotton grass *Eriophorum* spp., but less heath rush *Juncus squarrosus*. Plots with reduced sheep supported 59% fewer breeding waders, particularly lapwing *Vanellus vanellus*, and 60% fewer grey partridge *Perdix perdix*. Sheep reduction probably benefited black grouse *Tetrao tetrix*, which showed an increase in lekking males of 4.6% (SE=2.1) per annum following stock reduction compared to a decline of 1.7% (SE=1.4) per annum on plots without stock reduction. Sheep removal in autumn and winter was associated with the presence of large (up to 40) flocks of black grouse. Sheep reduction had conservation benefits, at least for black grouse, but may negatively affect overall avian biodiversity if implemented on large spatial scales. Development of appropriate scales of habitat mosaics is essential for optimizing bird conservation in the uplands.

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770. Spatial heterogeneity of low-density populations of *Melanoplus sanguinipes* (Orthoptera: Acrididae) associated with grazing and vegetation treatments.

Fielding, Dennis J.; Brusven, M. A.; Shafii, Bahman; and Price, William J.

Canadian Entomologist 133(6): 843-855. (2001)
 NAL Call #: 421 C16; ISSN: 0008-347X

Descriptors: animals and man/ disturbance by man/ commercial activities/ ecology/ population dynamics/ habitat/ terrestrial habitat/ abiotic factors/ physical factors/ land and freshwater zones/ Nearctic Region/ North America/ USA/ *Melanoplus sanguinipes* (Saltatoria): farming and agriculture/ livestock grazing/ population density/ low density populations/ distribution within habitat/ spatial heterogeneity of low density populations/ grassland/ climate and weather/ Idaho/ south/ spatial distribution of low density populations/ effects of grazing and vegetation/ rangelands/ Saltatoria/ Orthoptera/ Insecta/ arthropods/ insects/ invertebrates

Abstract: The objectives of this study were to determine whether the spatial distribution of *Melanoplus sanguinipes* F., the most abundant species of grasshopper on rangeland in southern Idaho, varied annually in response to changing patterns of grazing and to investigate how vegetation affects the spatial distribution of low-density populations of *M. sanguinipes* at scales relevant to most rangeland-management activities. A lattice of 72 sites was established across nine pastures, covering approximately 5000 ha. At each site, densities of *M. sanguinipes*, percent canopy coverage by plant species, and percent forage utilization by livestock were estimated twice per year, in June when *M. sanguinipes* was in the nymphal stage and in August during the adult stage, for 4 years, 1991-1994. Spatial analyses of variance were used to evaluate the influence of grazing and vegetation type on densities of *M. sanguinipes*. In August of each year, densities of *M. sanguinipes* were lower on heavily grazed sites than on lightly grazed sites, except in 1993, when the opposite trend was observed. Above-normal precipitation in 1993 resulted in abundant growth of annual forbs and regrowth of grazed plants. The distribution of nymphs in June of 1993 and 1994 reflected the grazing patterns of the previous summer. Densities of *M. sanguinipes* were lower on crested wheatgrass habitats than on annual grasslands for every sampling period from June 1991 to June 1993, after which no differences were observed. We interpret the results to suggest that grazing effects on low-density populations of *M. sanguinipes* were contingent on weather conditions; under dry conditions, grazed habitats were less favorable to *M. sanguinipes* but, during relatively cool wet summers, grazing created conditions that were more favorable to *M. sanguinipes*.
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771. Species diversity and habitat of grassland passerines during grazing of a prescribe-burned, mixed-grass prairie.

Danley, Robert F.; Murphy, Robert K.; and Madden, Elizabeth M.

Western North American Naturalist 64(1): 72-77. (2004)
NAL Call #: QH1 .G7; ISSN: 1527-0904

Descriptors: prescribed burning: applied and field techniques/ rotation grazing: applied and field techniques/ grazing/ habitat management/ mixed grass prairie: prescribe burned/ species diversity/ stocking rates

Abstract: No published data exist on responses of grassland passerines and their habitat to combined grazing and burning treatments in northern mixed-grass prairie. At Lostwood National Wildlife Refuge (LNWR) in northwestern North Dakota, we monitored breeding bird occurrence, abundance, and habitat during successive annual grazing treatments (1998-2000) on 5 prescribe-burned, mixed-grass prairie management units (range=50-534 ha, each

burned 3-6 times in the previous 10-20 years). All breeding passerine species characteristic of upland, northern mixed-grass prairie were common (>10% occurrence) during at least 1 of 3 years on burned and grazed units, except Chestnut-collared Longspur (*Calcarius ornatus*), which was uncommon. Vegetation was generally shorter and sparser than that found on 4 nearby units treated by fire only (1999; density, visual obstruction, and height, all $P < 0.01$). Regardless, occurrences of individual bird species resembled those previously documented on prairie units at LNWR with similar fire histories but no grazing; however, Brown-headed Cowbird (*Molothrus ater*) occurred 2.4 times more frequently on burned and grazed units studied. Our data suggest that species diversity of breeding grassland passerines changes little during initial years of rotation grazing at moderate stocking rates in fire-managed, northern mixed-grass prairie at LNWR.
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772. Spring livestock grazing affects crested wheatgrass regrowth and winter use by mule deer.

Austin, D. D.; Urness, P. J.; and Fierro, L. C.

Journal of Range Management 36(5): 589-593. (1983)
NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1983/365/12aust.pdf>

Descriptors: Utah

This citation is from AGRICOLA.

773. The status, habitat, and response to grazing of water vole populations in the Big Horn Mountains of Wyoming, U.S.A.

Klaus, Marion

Arctic Antarctic and Alpine Research 35(1): 100-109. (2003)

NAL Call #: GB395.A73; ISSN: 1523-0430

Descriptors: USDA Forest Service/ altitude/ bank structure/ channel types/ conservation status/ creeks/ dry weight biomass/ grazing responses/ habitat profiles/ habitat requirements/ historical records/ percent plant cover/ precipitation/ riparian environments/ soils/ species abundance/ stream depth/ temperature

Abstract: *Microtus richardsoni*, the water vole, was listed as a sensitive species in Region 2 of the USDA Forest Service in 1994. Historical records indicate water voles were found in the Big Horn Mountains, but little was known about their current status. The purpose of this study was to locate water voles in the Big Horn Mountains of Wyoming, develop a habitat profile, and evaluate the extent to which livestock grazing affects them. Accessible creeks with habitat requirements for water voles were surveyed. Water voles were not captured below 2440 m. Grazed and ungrazed sites occupied by water voles were matched and analyzed for percent plant cover, dry weight biomass, riparian classification, mean stream depth, channel type, elevation, precipitation, and temperature. Capture success was significantly greater in ungrazed areas. Percent cover by ferns and thallophytes was significantly greater in areas where water voles were more abundant, and bare ground was significantly greater at grazed locations. Water voles were most abundant on Rosgen B or E streams with a willow/wet *Carex* riparian class that is found on relatively undisturbed sites with stable, well-developed soils and bank structure. In the Big Horn Mountains, water vole captures

were low in comparison to the Beartooth Mountains and synergistic effects of grazing and drying might negatively impact this species.

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774. Stream habitat and fisheries response to livestock grazing and instream improvement structures, Big Creek, Utah.

Platts, W. S. and Nelson, R. L.

Journal of Soil and Water Conservation 40(4): 374-379. (1985)

NAL Call #: 56.8 J822; ISSN: 0022-4561

Descriptors: environmental degradation/ fisheries/ grazing/ habitat destruction/ livestock/ rangelands/ streams/ Utah

This citation is from AGRICOLA.

775. Summer grassland cover on cattle farms in Kwazulu-Natal: Does it limit nesting habitat for helmeted guineafowl?

Malan, G.

South African Journal of Wildlife Research 28(4): 105-109. (1998)

NAL Call #: SK575.S6S6; ISSN: 0379-4369

Descriptors: Galliformes/ Numididae/ Numida meleagris

Abstract: The author studied the potential temporal bottleneck for nesting helmeted guineafowl on cattle farms in KwaZulu-Natal, South Africa. After the first summer rains and at the start of the guineafowl breeding season, grassland cover is at a minimum because of intensive winter burning and summer cattle grazing programs. The termination of sheep farming in the area and how it could have contributed to the decline in guineafowl numbers are also discussed. slj.

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776. Suppression of grasshoppers in the Great Plains through grazing management.

Onsager, J. A.

Journal of Range Management 53(6): 592-602. (2000)

NAL Call #: 60.18 J82; ISSN: 0022-409X

http://jrm.library.arizona.edu/data/2000/536/592-602_onsager.pdf

Descriptors: Melanoplus sanguinipes/ insect control/ rotational grazing/ canopy/ rain/ heat sums/ biomass/ prairies/ Agropyron cristatum/ population density/ Acrididae/ mortality/ life cycle/ range management/ North Dakota

This citation is from AGRICOLA.

777. Trout habitat, abundance, and fishing opportunities in fenced vs unfenced riparian habitat along Sheep Creek, Colorado.

Stuber, R. J.

In: Riparian ecosystems and their management: Reconciling conflicting uses. (Held 16 Apr 1985-18 Apr 1985 at Tuscon, Ariz.) Johnson, R. Roy; Ziebell, Charles D.; Patton, David R.; Ffolliott, Peter F.; and Hamre, R. H. (eds.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, United States, Forest Service; pp. 310-314; 1985.

NAL Call #: aSD11.A42

Descriptors: riparian environments/ livestock/ river banks/ grazing/ abundance/ Salmo/ standing stock/ USA, Colorado, Sheep Creek/ livestock

Abstract: Fencing was used to protect 40 hectares of

riparian stream habitat along 2.5 km of Sheep Creek, Colorado, from adverse impacts due to heavy streamside recreation use and cattle grazing. Fish habitat within the fenced area was narrower, deeper, had less streambank alteration, and better streamside vegetation than comparable unfenced sections. Estimated trout standing crop was twice as great, and proportional stock density (PSD) was higher than in unfenced sections. There was a higher proportion of nongame fish present in unfenced sections. Projected fishing opportunities within the fenced sections were double those estimated for a comparable length of unfenced habitat along the same stream.

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778. Upland bird research: Evaluation of livestock grazing and residual herbaceous cover on sage grouse nest success.

Giesen, K. M. Colorado Division of Wildlife, 1995. 16 pp. Job Final Report.

Notes: Period Covered: 1 January 1993 - 31 December 1994

Descriptors: telemetry/ habitat/ female/ vegetation/ size/ sagebrush/ predation/ trapping/ marking/ North America/ United States/ Colorado/ western region/ Jackson County

Abstract: Six strutting grounds in North Park, Colorado (Boettcher Junction, Coalmont, Delaney Butte, Lost Creek, Raven, and Spring Creek) were selected for documentation of hen movements to nests. Nesting habitat adjacent to each study lek was identified, and nest success and causes of failures were ascertained. Vegetative structure at nest sites was measured to determine possible selection for specific nesting habitats. Grazing from a portion of the nesting habitat associated with each strutting ground studied was experimentally excluded, and subsequent nest success between nests in grazing exclosures and control areas was compared.

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779. The use of cattle as a management tool for wildlife in shrub-willow riparian systems.

Krueger, H. O. and Anderson, S. H.

In: Riparian ecosystems and their management: Reconciling conflicting uses. (Held 16 Apr 1985-18 Apr 1985 at Tuscon, Ariz.) Johnson, R. Roy; Ziebell, Charles D.; Patton, David R.; Ffolliott, Peter F.; and Hamre, R. H. (eds.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, United States, Forest Service; pp. 300-304; 1985.

NAL Call #: aSD11.A42

Descriptors: cattle/ grazing/ wildlife/ habitats/ resource management

This citation is from AGRICOLA.

780. The use of domestic herbivores in the management of wetlands for waterbirds in the Camargue, France.

Duncan, P. and D'Herbes, J. M.

In: Managing wetlands and their birds: A manual of wetland and waterfowl management/ Scott, D. A., 1982; pp. 51-66.

Notes: Publisher: International Waterfowl Research Bureau

Descriptors: Equus caballus/ Bos taurus/ Ciconiiformes/

Anseriformes/ Ardeidae/ birds, water/ ecosystems/ grazing/ habitat alterations/ management/ wetlands/ waterfowl/ horse/ cattle/ wetland/ vegetation
© NISC

781. Using short duration grazing to accomplish wildlife habitat objectives.

Guthery, F. S.; DeYoung, C. A.; Bryant, F. C.; and Drawe, D. L.

In: Can livestock be used as a tool to enhance wildlife habitat? (Held 13 Feb 1990 at Reno, Nev.)

Severson, Kieth E. (eds.)

Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, US Department of Agriculture, Forest Service; pp. 41-55; 1990.

Notes: 43rd Annual Meeting of the Society for Range Management

NAL Call #: aSD11.A42 no.194

Descriptors: animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ ecology/ habitat/ terrestrial habitat/ abiotic factors/ physical factors/ Aves/ Mammalia: farming and agriculture/ short duration grazing use as habitat management tool/ habitat management/ short duration grazing use/ population dynamics/ short duration grazing effects/ habitat management aspects/ grassland/ habitat management by short duration grazing/ review/ aridity/ desertification reversal due to livestock watering/ conservation aspects/ birds/ chordates/ mammals/ vertebrates

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782. Utilisation of Wadden Sea salt marshes by geese in relation to livestock grazing.

Bos, Daan; Loonen, Maarten J. J. E.; Stock, Martin; Hofeditz, Frank; Van Der Graaf, Alexandra J.; and Bakker, Jan P.

Journal for Nature Conservation 13(1): 1-15. (2005); ISSN: 1617-1381

Descriptors: sandy soil/ salt marsh/ livestock grazing/ canopy height/ goose dropping density/ spring feeding/ habitat use

Abstract: To arctic breeding geese, the salt marshes of the International Wadden Sea are important spring staging areas. Many of these marshes have always been grazed with livestock (mainly cattle and sheep). To evaluate the influence of livestock grazing on composition and structure of salt-marsh communities and its consequences for habitat use by geese, a total of 17 pairs of grazed and ungrazed marshes were visited both in April and May 1999, and the accumulated grazing pressure by geese was estimated using dropping counts. Observed grazing pressure was related to management status and to relevant vegetation parameters. The intensity of livestock grazing influences the vegetation on the marsh. Salt marshes that are not grazed by livestock are characterised by stands with a tatter canopy, a lower cover of grasses preferred by geese, and a higher cover of plants that are not preferred. Overall goose-dropping densities are significantly lower in ungrazed marshes compared to marshes grazed by livestock. Some ungrazed marshes had comparatively high goose grazing pressure, and these were all natural marshes on a sandy soil, or artificial mainland marshes with a recent history of intensive livestock grazing. Goose grazing is associated with a short canopy. The plant communities with short

canopy, dominated by *Agrostis stolonifera*, *Festuca rubra* and *Puccinellia maritima*, together account for 85% of all goose droppings in our data. The sites that were not visited by geese differed very little from those that were visited, in the parameters we measured. This might indicate that there was no shortage of available habitat for spring staging geese in the Wadden Sea, in the study period (C) 2005 Elsevier GmbH. All rights reserved.

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783. Vegetation cover and forb responses to cattle exclusion: Implications for pronghorn.

Loeser, Matthew R.; Mezulis, Sharon D.; Sisk, Thomas D.; and Theimer, Tad C.

Rangeland Ecology and Management 58(3): 234-238. (2005)

NAL Call #: SF85 .J67; ISSN: 1550-7424

Descriptors: animals and man/ disturbance by man/ commercial activities/ nutrition/ diet/ ecology/ habitat/ land zones/ Nearctic Region/ USA/ North America/ *Antilocapra americana* (Bovidae): farming and agriculture/ cattle exclusion/ implications for fawn hiding cover and forb availability on rangeland/ food plants/ food availability/ habitat utilization/ terrestrial habitat/ rangeland habitat/ Arizona/ Anderson Mesa/ fawn hiding cover and forb availability on rangeland in response to cattle exclusion/ Bovidae/ Artiodactyla/ Mammalia/ chordates/ mammals/ ungulates/ vertebrates

Abstract: Cattle grazing is often implicated as a factor that reduces vegetative cover and the abundance of important forage plants for wildlife. Recent declines in northern Arizona populations of pronghorn (*Antilocapra americana* Ord) have focused public and scientific attention on the factors contributing to low fawn recruitment and the potential benefits of cattle removal. To further understand the effects of cattle grazing, we studied the potential hiding cover provided by standing live and dead herbaceous matter as well as forb richness and canopy cover following 5 years of cattle removal. Cattle removal increased horizontal hiding cover by 8% at a distance of 5 in ($P = 0.025$), but had no statistically significant effect on the potential hiding cover at distances of 10 in ($P = 0.105$) or 25 in ($P = 0.746$). Forb species richness was 16% lower in exclosures than in an adjacent grazed pasture in 2001 ($P = 0.036$), but no differences were observed in 2002 ($P = 0.636$). The canopy cover of forbs was generally unaffected by cattle removal. These results suggest that curtailing or removing cattle is unlikely, by itself, to lead to rapid improvements in the hiding cover or forb availability for pronghorn on similar rangelands in northern Arizona. In this region, where immediate improvements in fawn survival and recruitment are important to population persistence, additional management actions should be considered.

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784. Vole mound effects and disturbance rate in a Mediterranean plant community under different grazing and irrigation regimes.

Rebollo, S.; Perez Camacho, L.; Valencia, J.; and Gomez Sal, A.

Plant Ecology 169(2): 227-243. (2003)

NAL Call #: QK900.P63; ISSN: 1385-0237

Descriptors: Mediterranean plant community/ abandoned cropland/ disturbance rate/ early succession/ forage resource availability/ grazing regime/ ground disturbance/

irrigation regime/ mound building activity/ plant species conservation/ plant succession/ small scale disturbance/ species richness/ trophic resources/ vole mound effects
Abstract: A factorial field experiment was used to assess the influence of soil-disturber mammals in the structure of a 9-year-old Mediterranean annual plant community subjected to different sheep grazing and irrigation regimes. We estimated the disturbance rate (mound building activity) by Mediterranean voles, their effects on vegetation and the mechanisms of these effects during a period of vole outbreak. The effects on vegetation were analysed at the levels of species, functional groups and plant community. Disturbance rate was high and voles can disturb the entire soil surface once every four or five years. The availability of certain trophic resources (perennial plants) appeared to drive vole expansion in the experimental plots and it was independent of the irrigation and grazing treatments. Mound building activities largely affected vegetation but conserved plot differences. Total vegetation cover, absolute cover of all functional groups, mean vegetation height and species richness were less on mounds than on undisturbed ground. These effects did not change the relative abundance of annuals, perennials, grasses and forbs. Only the relative abundance of small-seeded species decreased on mounds. As the proportion of these seeds was similar in both types of patches, we suggest that small-seeded species had more difficulties for germinating or emerging when they are buried during mound formation. Irrigation and sheep grazing promoted large changes in the vegetation parameters but these effects were, in general, similar on mounds and undisturbed ground. Our results show that the availability of germinable seeds may be the major limitation for mound revegetation, probably due to the scarcity of seeds existing at the depths from which soils are excavated. Our results also suggested a resource limitation on mounds. The results provide additional evidence that soil disturbances by small herbivore mammals exert relevant ecological effects on abandoned Mediterranean croplands. We discuss the ecological implications of vole mound-building activities for plant succession, plant species conservation and forage resource availability for livestock.
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785. Wildlife and livestock grazing alternatives in the Sierra Nevada.

Kie, John G.

Transactions of the Western Section of the Wildlife Society 27: 17-29. (1991)

NAL Call #: SK351.W523; ISSN: 0893-214X

Descriptors: animals and man/ disturbance by man/ commercial activities/ conservation/ conservation measures/ habitat/ land and freshwater zones/ Nearctic Region/ North America/ USA/ comprehensive zoology/ *Strix nebulosa* (Strigidae)/ *Molothrus ater* (Icteridae)/ *Empidonax traillii* (Tyrannidae)/ Mammalia: farming and agriculture/ alternative livestock grazing strategies/ habitat conservation benefit/ habitat management/ benefit of alternative livestock grazing strategies/ review/ terrestrial habitat/ conservation benefit of alternative livestock grazing strategies/ USA/ California/ Sierra Nevada/ habitat conservation benefit of alternative livestock grazing strategies/ Strigidae/ Strigiformes/ Aves/ birds/ chordates/ mammals/ vertebrates
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786. Wildlife habitat on grazed or ungrazed small pond shorelines in south Texas.

Whyte, R. J. and Cain, B. W.

Journal of Range Management 34(1): 64-68. (1981)

NAL Call #: 60.18 J82; ISSN: 0022-409X

<http://jrm.library.arizona.edu/data/1981/34/1/18whytpdf>

Descriptors: grazing/ littoral zone/ vegetation/ ponds/ community composition/ vegetation cover/ Aves/ USA, Texas/ effects on/ environmental effects/ vegetation cover/ vegetation

Abstract: Three man-made ponds constructed in 1956 and fenced to exclude cattle from the shoreline were selected to study the effects of cattle on shoreline vegetation. These ponds were partially opened in 1977 to allow grazing on one-half of the shoreline. In most areas the foliar cover and vegetation height were reduced by cattle pressure. The stable Longtom Community and the Knotgrass-Smartweed Community were more affected by cattle pressure than the Transition Community which changed as the water level rose or dropped. The seasonal Aquatic Community was least affected by cattle pressure and thus maintained good stands of waterfowl food plants. Carefully planned grazing which allows key rest and grazing periods will control the impact of grazing on the shoreline vegetation.
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787. Wildlife on ungrazed and grazed bottomlands on the South Platte River, northeastern Colorado.

Crouch, G. L.

In: Proceedings of the Wildlife-Livestock Relationships Symposium. (Held 20 Apr 1981-22 Apr 1981 at Coeur D'Alene, Idaho.) Peek, James M. and Dalke, P. D. (eds.) Moscow, Idaho: Forest, Wildlife & Range Experiment Station, University of Idaho; pp. 186-197; 1982.

NAL Call #: SF84.84.W5 1981

788. Wildlife responses to grazing management and habitat manipulation: The Welder Wildlife Refuge experience.

Drawe, D. L.

In: Proceedings of a conference on multispecies grazing. (Held 25 Jun 1985-28 Jun 1985 at Winrock International, Morrilton, Arkansas.) Baker, Frank H. and Jones, R. Katherine (eds.)

Morrilton, Ark.: Winrock International Institute for Agricultural Development; pp. 93-108; 1985.

NAL Call #: SF85.3.P76

Descriptors: range management/ objectives/ United States
 This citation is from AGRICOLA.

789. Wildlife use of livestock water under short duration and continuous grazing.

Prasad, N. L. N. S. and Guthery, F. S.

Wildlife Society Bulletin 14(4): 450-454. (1986)

NAL Call #: SK357.A1W5; ISSN: 0091-7648

Descriptors: *Odocoileus virginianus*/ *Procyon lotor*/ *Canis latrans*/ *Meleagris gallopavo*/ *Zenaid macroura*/ *Tayassu tajacu*/ *Molothrus ater*/ cattle/ grazing management/ Texas/ USA

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